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BULLETIN No. 52

BIOLOGICAL SERIES, No. 14

The Lepturini of America North of Mexico

PART I

BY

J. M. Swaine and Ralph Hopping
Entomological Branch, Department of Agriculture, Ottawa



OTTAWA
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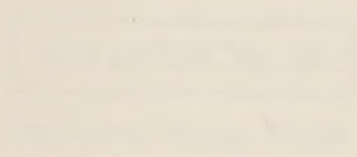
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The Journal of American North of America

PART 1

J. M. Smith and John Smith
J. M. Smith and John Smith




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THE LEPTURINI OF AMERICA NORTH OF MEXICO

Part I

INTRODUCTION

This paper presents the results of a study of the tribe Lepturini of the family Cerambycidae in America, north of Mexico. It attempts a revision of the genera and species, with keys, illustrations, and descriptions sufficient to enable the species to be determined satisfactorily, and an arrangement based upon their strongest affinities.

This group of beetles is composed almost entirely of wood-boring species, whose larvæ excavate tunnels in the trunks, limbs, or stumps of both deciduous and coniferous trees. Little is known about the habits of many of the species; but it is believed that most of them breed in dead wood; some are known to live in decaying wood, and a few attack living trees. Many of the species are abundant in our Canadian forests and it is desirable that more exact information should be obtained concerning their biology and their precise relationships to the trees in which they breed. This study is presented in the hope that it may assist in the determination of the genera and species of this rather difficult group and also thereby influence a closer study of their bionomics.

The large amount of material in the Canadian National collection, including an extensive collection of European species, has formed the basis for this study; but, in addition, the writers have studied the collections in the U.S. National Museum and the Casey collection at Washington; the Leconte collection at Cambridge, Mass.; the Horn collection at the Philadelphia Academy of Sciences; and that of Mr. J. N. Knull at Harrisburg, Pa. They have examined the collections of Mr. H. W. Wenzel and Mr. Frank Mason of Philadelphia and, through the kindness of many correspondents, have had before them many other collections and examples of rare species.

The number of specimens examined, as recorded under each species, usually refers to the material in the Canadian National collection, and to the collections sent in for special study.

No attempt has been made to record all the locality records given in literature. In so many cases the records were obviously taken from incorrect determinations that it seemed more useful to state the general distribution from the most reliable information available at the time.

The writers wish to express their grateful appreciation for the help they have received so generously from many entomologists. Particularly helpful has been the assistance of Dr. S. A. Rohwer and Mr. W. S. Fisher, of the U.S. National Museum, Washington, D.C.; Mr. J. N. Knull and Mr. A. B. Champlain, Harrisburg, Pa.; Mr. Nathan Banks, Agassiz Museum, Cambridge, Mass.; Mr. H. C. Fall, Tyngsboro, Mass.; Mr. H. P. Loding, Mobile, Ala.; Mr. C. A. Frost, S. Framingham, Mass.; Mr. Warren Knaus, McPherson, Kan.; Mr. Charles Liebeck, Philadelphia; Mr. L. L. Buchanan, Biological Survey, Washington, D.C.; Dr. E. C.

Van Dyke, University of California; Mr. E. C. Van Duzee, Academy Sciences, San Francisco; Dr. F. E. Blaisdell, San Francisco; Mr. Chas. Schaeffer, Brooklyn Museum; Mr. H. W. Wenzel, Philadelphia; Prof. C. J. Drake, Ames, Iowa; Prof. H. F. Wickham, University of Iowa; Prof. R. H. Beamer, University of Kansas, Mr. S. A. Hardy, Provincial Museum, Victoria, B.C.; Mr. F. S. Carr, Medicine Hat, Alberta; Mr. J. B. Wallis, Winnipeg, Man.; and Dr. J. H. McDunnough and Mr. J. J. de Gryse of the Dominion Entomological Branch, Ottawa, for the loan of specimens, comparison of material with types, the discussion of synonymy, or for helpful suggestions.

When the study was first undertaken Dr. F. C. Craighead joined the writers in a preliminary study of characters in the species of this subfamily and has in many cases been consulted with reference to co-ordinating the characters of the larvæ with those of the adults.

Mr. F. C. Hennessey, artist in the Dominion Entomological Branch, has made the drawings and photographs illustrating this paper, under the careful supervision of the writers.

VARIATIONS

Some species in this tribe present only a few minor variations, even when a long series is studied; whereas other species vary greatly even in the same locality, or have local colour forms which in some cases are probably seasonal or climatic. In many instances we have taken the extremes in colour variation in copulation and thus established definite relationships.

The marked variation in many species of the Lepturini has naturally led to the description of forms or races under specific names, particularly when the specimens dealt with came from widely separated localities. As our collections and our knowledge of distribution increase, these names must be relegated to synonymy. Any study of this kind, based on museum specimens alone, must at best be imperfect, even though both external and internal characters be thoroughly exploited. At present, we can only look forward to the time when taxonomic work can be based upon the study of a large number of individuals of all the species, representing the extreme geographic range, including both external and internal characters and all life-stages of the species, a wide knowledge of the biology, and information that can be obtained only through crossbreeding closely related forms. In the meantime, progress can be made by using all the information that is available.

In a few species of this group the colour differs markedly between the sexes, as in *Leptura abdominalis* Hald. and *Anoplodera laetifica* Lec. Colour variations from luteus or testaceous through every variety of maculation to completely black are found in certain species. In some, such as *Anoplodera instabilis* Hald., the abdominal segments may be black, rufous, or testaceous. The legs may be black, testaceous, or bicoloured in the same species, as in *Grammoptera subargentata* Kby. and in *G. ruficeps* Lec. The elytral apices may be acutely rounded, broadly rounded, or subtruncate, as in *Anoplodera crassipes* Lec., or may be either emarginate or subemarginate, as in certain species of *Leptura*. The colour of the prothorax in many cases varies in the same species from rufous or testaceous to black, as in *Pidonia ruficollis* Say. In some long series from the same locality, these colour variations grade imperceptibly from one extreme to the other and we have been obliged to conclude that these belong to the same species.

The collections we have studied have convinced us that every variation may be found connecting some so-called eastern and western species, such as *Anoplodera tibialis* Lec. and *A. hirtella* Lec., and *Anoplodera canadensis* Fab. and *A. cribripennis* Lec. Certain of these species are found generally throughout the Canadian and part of the Transitional Zones; *Anoplodera canadensis* Fab., *A. tibialis* Lec., *A. sanguinea* Lec., and *A. sexmaculata* Linn. are examples.

Some species vary in size to such an astounding degree that the extremes are hardly recognizable as conspecific, whereas others, such as *Grammoptera molybdica* Lec. and *Anoplodera sexspilota* Lec., appear to be rather constant in size.

THE STERNUM

The *prosternum* presents two apparently distinct conditions, by means of which the tribe may be divided into two groups. The first section of the tribe, from *Pyrotrichus* to *Pidonia*, has the prosternum depressed or concave in front of the coxæ, and, in particular, transversely impressed or excavated by a broad, submedian groove, situated well behind the anterior margin; this groove being the continuation, without any interruption on the sides, of the broad, anterior, dorsal impression of the pronotum. In the genera from *Grammoptera* onward, the anterior, dorsal, transverse impression of the pronotum is interrupted on the sides by an elongate, oblique elevation and is not continued directly to the ventral side, except as a narrow sulcus immediately behind the anterior margin. The prosternum, therefore, appears convex, usually sloping gradually or arcuately from the coxæ to the narrow, anterior, marginal sulcus just described. In *Stenocorus*, the *intercoxal piece of the prosternum* is enormously protuberant, in some males projecting beyond the coxæ and formed into a spine. In species of *Anthophilax* this condition is approximated and in other genera a tendency toward a similar condition may be noted.

The width of the anterior coxal separation varies considerably, even between species otherwise closely related. When the intercoxal piece is not widened at its posterior extremity, the forecoxal cavities are open behind, as is notably the case throughout the first part of the tribe from *Pyrotrichus* to *Pidonia* and in the genera *Grammoptera* and *Alosterna*. In some cases the intercoxal piece is reduced to an exceedingly thin septum which does not even attain the posterior margin of the coxæ. In the genera which follow *Pidonia* in the series, the extremity of the intercoxal piece is variably widened, so that the coxal cavities become narrowly open behind and, in a few cases, such as *Pseudostrangalia* and *Anoplodera valida* Lec., a complete closure of the cavities is effected by the lateral projection of the extremity of the intercoxal piece meeting the mesal projection of the proepisternum behind the coxæ. In *Anoplodera aspera* Lec. and *A. mutabilis* Newm. the coxæ are rather widely separated, suggesting with other characters, such as the shape of the pronotum, the feebly convex prosternum and the pubescent sole of the first segment of the hind tarsi, affinities with the first group of the subfamily. In *A. biforis* Newm., also, the forecoxæ are distinctly separated, emphasizing the isolated position of that species.

The *mesosternum* varies in width and in conformation, being usually oblique between the coxæ, but occasionally declivous and transversely carinate.

The *metasternum*, usually feebly convex, is in some species distinctly inflated, particularly in the males, and in the males of *Anoploclera isabellae* Hop. and *sexspilota* Lec. it bears distinct longitudinal carinae.

The *metepisternum* varies from a short and broad subtriangular shape, common in most of the genera, to a very elongate condition with the sides parallel for the greater part of the width, as in the genera *Pidonina* and *Grammoptera*. This condition varies in *Anoploclera*, the metepisternum being noticeably slender in some species, particularly in *aspera* Lec. and *mutabilis* Newm.

THE PUBESCENT SOLE

The underside of the first three segments of the fore and middle tarsi, and of the third segment of the hind tarsi, are invariably clothed with a dense carpet of erect, slender, pile-like setae, known as the *pubescent sole*. This condition is in many cases present on the second hind tarsal segment and is present on the first segment also throughout the first division of the tribe, from *Pyrotrichus* to *Pidonina*, and in the genera *Grammoptera* and *Alosterna*. It is rarely found in the succeeding genera; but it is distinctly present in a few species, such as *Anoploclera mutabilis* Newm., *A. aspera* Lec., *A. valida* Lec., *A. insignis* Fall, *A. obscura* n. sp., *A. matthewsi* Lec., and *A. biforis* Newm. Usually, in the latter part of the tribe, the underside of the first hind tarsal segment is clothed with stiff setae, little more densely than the normal condition; but in a number of species, such as *Anoploclera instabilis* Hald., and *A. proxima* Say, this area is covered by a brush of very stiff, stout, suberect setae, forming a distinct *tarsal brush*, in some cases deceptively similar to the true pubescent sole, until examined very carefully. The recurrence of this pubescent sole in species of the genus *Anoploclera* suggests a closer relationship with *Pidonina* and *Acmaeops*.

There is considerable variation in the relative lengths of the tarsal segments. In *Leptura propinqua* Bland, for example, the first segment of the hind tarsus is exceptionally long. In some species the third segment of the hind tarsus is cleft nearly to the base; in others it is strongly emarginate or not cleft beyond the middle. In a few cases these characters have been utilized in separating the species and genera.

SEXUAL DIFFERENCES

The males of this group are, as a rule, smaller than the females and usually have longer and more slender antennae; but in some species males and females occur with the antennae of equal length, and there may be great variation in this regard even in the same sex. The antennae of the males are commonly somewhat serrate, and that condition is present also in the females of some species to a lesser degree.

The differences in the terminal segments of the abdomen provide the most reliable distinction between the sexes. The last tergite of the female, the seventh visible segment, is elongate, subtriangular, usually margined along the sides, rounded or rarely truncate or feebly emarginate at the apex. It bears few distinctive characters, but in a few species, *Anoploclera proxima* Say and allies, it is variably carinate on the middle line near the apex. In the male, this segment is represented by two shorter tergites, in

most cases somewhat inflated, so that the last plate is more or less vertical in position. The last ventral segment of the female is usually convex or feebly flattened toward the apex, which is rounded, truncate, or emarginate on the posterior margin. In the males, the last sternite is in most cases impressed or in some species very strongly excavated at the apex, with the apex emarginate and its angles variably produced.

These characters indicate relationships in the minor groups more or less distinctly, and exhibit marked variations among species otherwise closely allied, as well as obvious cases of convergence.

In *Leptura*, most species have the last ventral of the male very strongly emarginate, with that of the female only feebly so. *Leptura lineola* Say forms an exception. In *Grammoptera*, the terminal segments are rounded at the apex, with the last ventral in many cases feebly impressed. In *Pidonia*, the series *scripta* Lec., *straussi* Webb, and *ruficollis* Say have the last two ventral segments of the male broadly excavated, the last segment very strongly so, with its sides greatly elevated into processes. In *aurata* Horn, the last ventral of the male is impressed on the middle line at the apex; the male of *gnathoides* Lec. we have not seen.

In the genus *Anoplodera*, *brevicornis* Lec. and *nigrella* Lec. have the apex of the last ventral segment in the male strongly emarginate, whereas in *matthewsi* Lec. and *grossa* Lec. the emargination is very feeble. In the following group, including *instabilis* Hald., *sexmaculata* Linn., *tribalteata* Lec., *coquiletti* Linell, and *amabilis* Lec., the terminal segments are usually rounded at the apex. In *cordifera* Oliv., the last ventral of the male is elevated broadly at the middle and broadly and obliquely excavated on the apical half, emphasizing the isolated position of this species. In *nitens* Forst., *tigrina* Csy., and *laeta* Lec., the usual condition is reversed, the last dorsal being emarginate and the last ventral rounded in both sexes. In *tibialis* Lec., *crassipes* Lec., *behrensi* Lec., *octonotota* Say, and *cockerelli* Fall, the terminal segments of the female are subtruncate and the last ventral of the male strongly emarginate. In *aspera* Lec. and *mutabilis* Newm. there is a tendency to emargination in the dorsal rather than the ventral terminal segments, whereas in *sanguinea* Lec., *laetifica* Lec., and *haldemani* Csy., the last ventral of the male is feebly emarginate.

In the series *dolorosa* Lec. to *nigrolineata* Bland, the last ventral of the male is variably impressed or excavated and emarginate at the apex. In *atrata* Lec. and *proxima* Say, this segment is triangularly, strongly excavated at the apex; in *dolorosa* Lec. and *biforis* Newm. it is less strongly impressed. In *canadensis* Oliv., *chrysocoma* Kby., and *nigrolineata* Bland, both dorsal and ventral segments vary from strongly emarginate to feebly emarginate in both sexes, except that the last dorsal of the male in *chrysocoma* Kby. is hardly emarginate with the last dorsal of the female rather strongly emarginate. The last group of the genus, including the series from *rubrica* Say to *vittata* Oliv., have the last ventral of the male variably impressed. Of these, *dehiscens* Lec., *vagans* Oliv., *rubrica* Say, and *circumdata* Oliv. have the last ventral of the male strongly impressed and emarginate with the last dorsal rounded. In *pernigra* Linell, the last ventral of the male is broadly excavated with the sides elevated at the apex, and the apical margin strongly rounded, fitting into the margin of the inflated last dorsal. The same structure obtains in *vexatrix* Mann. and, less strongly, in *pubera* Say, whereas in *vittata* Oliv. there is only a feeble tendency toward the same condition.

It has already been stated that distinctive colour differences between the sexes occur in a few species; but a more remarkable condition is found in *A. laetifica* Lec., in which the elytra of the male are black, shining, and coarsely punctured, whereas those of the female are red, opaque, and finely punctured.¹

WING VENATION

The venation of the wings in the Lepturini presents several interesting features, some of which may be utilized in the classification.

The two most striking characters are the condition of the closed cell in the radial sector and the presence or absence of a closed cell in the anal sector.

In the genera *Leptura* and *Bellamira*, the cell in the radial sector is very elongate, with the extension of Radius arising from near the middle of the caudal margin. In *Anoplodera* and most of the other genera this cell is short and subtriangular, approximately as wide as long. It is interesting that the species of *Typocerus*, which European writers have placed as a subgenus of "*Strangalia*" (*Leptura* of this paper) have the short, wide cell of *Anoplodera*. *Typocerus*, however, has the cubito-anal cross-vein similar to *Leptura*. In *A. insignis* Fall the radial cell is somewhat as in *Leptura*. In *A. octonotata* Say, *aspera* Lec., and *mutabilis* Newm., the cell is somewhat elongate, but the cross-vein forming its proximal margin is directed latero-caudad.

The closed cell in the anal sector is found in North American genera only in *Stenocorus*, *Anthophilax*, *Centrodera*, *Pachyta*, and *Leptacmaeops*,² and serves to distinguish these genera as a separate group. Our conclusion that (*Pachyta*) *rugipennis* Lec. should be removed from the genus *Pachyta* was confirmed by the absence of this cell from the *rugipennis* wing. The genus *Leptacmaeops* was recognized by Colonel Casey as distinct from *Acmaeops*, and the presence of the anal cell in the species of *Leptacmaeops* connects the genus definitely with *Pachyta* and its allies.

The junction of the first anal with the cubito-anal (C.A.) cross-vein varies from gradually arcuate in *Pidonia*, *Grammoptera*, and *Alosterna*, to strongly arcuate, nearly at a right angle, in *Anoplodera*, to strongly angular and recurrent in *Leptura*. There are many variations. *A. sanguinea* Lec., *vittata* Oliv., and *octonotata* Say, have this character nearly as in *Pidonia*, whereas in *A. chrysocoma* Kby., it is similar to *Leptura*.

In some sections of *Anoplodera* and allied genera the outer section of the anal veins, between Cubitus and 2nd Anal, is reduced in density, whereas in *Pidonia*, *Grammoptera*, and *Alosterna* this region is greatly strengthened, although the cubito-anal cross-vein itself is in many cases reduced. *A. vittata* Oliv., *L. lineola* Say, and some others resemble *Pidonia* in this character. The venation of *A. vittata* Oliv. resembles *Pidonia* more closely than *Anoplodera*. The chief stress-bearing veins of the wing, Radius, with radial cell, Media, Cubitus, and 2nd Anal, show little variation in wings of the same species; but the outer part of the 1st and 2nd Anals, between Cubitus and 2nd Anal, show distinct variation in the

¹A description of the male genitalia of the Lepturini, revealing interesting group characters, may be presented in the second part of this paper.

²*Xylosteus* and *Piodes* are included in this group on other characters, although their wing venation has not been examined.

presence and position of branches, even between the two wings of the same insect; so that it is useless to draw conclusions based on these characters, from one individual. The 1st Anal and 2nd Anal are not commonly divided at the tip in individual wings. The 1st Anal may be entirely absent in a few species, such as *Ch. americana* Hald., and *P. cruentata* Hald. (only a few examined), and is apparently absent at the tip in *Evodinus monticola* Rand.

It is evident that the wing venation in the *Lepturini* presents excellent group and generic characters and may be utilized, in places, for the identification of species. This subject may be dealt with at greater length in a later part of this series.

In the recent instructive papers on the wing venation of North American Coleoptera, by Graham, Forbes, and Good, the names of Radius, Media, and Cubitus were applied to different series of veins. A brief study of the relation of the veins to the articulating sclerites in the wings of the Coleoptera inclines us towards the interpretation presented by Forbes and Good.

In Plate XI, the articulating sclerites are named according to Snodgrass. Judged solely by the attachments, the first three veins, from the anterior margin of the wing, are evidently Costa, Subcosta, and Radius, since they articulate normally with the first and second Axillaries. The Anals, which articulate with the third axillary sclerite, are evidently the 2nd, 3rd, and 4th, so named in Plate XI. The 1st Anal, which would be more aptly named Cubito-anal, should fuse at the base with Cubitus and Media and articulate with the Median Plate. It is evidently that named "1st A" in the figure. The next vein in front of 1st A should then be Cubitus, and it fills all the requirements of that vein in its articulation with the Median Plate. The short cross-vein, labelled "arc," is then probably *Arculus* as indicated by Forbes. The base of the vein considered here as 1st A is in this section of the Coleoptera suggestively like *Arculus*, but it invariably fuses with the dorsal face of the vein immediately in front, and meets, but, in the wings we have studied, never fuses with the vein interpreted as Radius. Media, according to this interpretation, is present only in the outer portion of the wing.

PROEPISTERNAL PITS

The proepisternal area in the genus *Typocerus*, and in the many other species, bears very large punctures, *proepisternal pits*, varying in number in the different species, each pit bearing normally a slender seta. In many species the long, flying hairs of the sides of the pronotum arise from these pits. In some cases this character could be utilized in distinguishing the species.

PORIFEROUS AREAS OF THE ANTENNÆ

The distal segments of the antennæ in the genera *Typocerus* and *Strangalina* bear impressed poriferous areas with definite margins, usually on two or more sides. These areas are usually elongate, in some cases very large, particularly in the males, in many cases covering the entire face of the segment. The impressed surface is burnished, composed of many closely packed punctures, separated by smooth, anastomosing ridges, each puncture bearing a minute seta. They are undoubtedly special sense organs.

In the genus *Alosterna*, the distal segments of the antennæ bear irregular, elongate impressions at the bottom of which are a smaller number of closely placed punctures; and usually similar punctures may be seen scattered over the neighbouring surface of the segment.

In some females of other genera, small pits occur irregularly on the distal segments of the antennæ, and in some females of *Anoploclera* the distal segments bear a rather coarse pit on the underside at the distal extremity.

ANTENNAL CARINA

On the inner face of the antennal segments, in the genera *Leptura* and *Acmaeops*, particularly in the males, and in many other species of this group, there appears a distinct longitudinal carina, in some cases on only a few segments, in others on most of the segments from the fourth outward. This character could be utilized in distinguishing some species.

BIOLOGY

Very little is known of the biology of most of the species in this group. Probably most are wood borers during larval life. Some apparently breed in many species of trees, rarely in both coniferous and deciduous; some are confined to one or to a few tree species and many prefer decaying wood. Very few, such as *Anoploclera nitens* Forst., breed in living trees (Craighead). Adults of many species (*Anoploclera*, *Grammoptera*, *Typocerus*, *Leptura*) are pollen feeders and are commonly found on flowers.

The best published account of the biology of this group and its allies will be found in Craighead's "North American Cerambycid Larvæ," 1923.

LARVAL GROUPS

In the work just cited, Dr. Craighead has given a valuable account of the larval characters in many species in this group. He has been good enough to prepare, for insertion here, a list indicating the generic grouping that is suggested by a study of larval characters alone.

Larval Groups of Generic Value

Group I— <i>biforis</i> Newm.	Group VI— <i>bicolor</i> Swed.
Group II— <i>subhamata</i> Rand.	<i>famelica</i> Newm.
<i>plagifera</i> Lec.	<i>luteicornis</i> Fab.
<i>obliterata</i> Hald.	<i>acuminata</i> Oliv.
<i>propinqua</i> Bland.	<i>velutinus</i> Oliv.
Group III— <i>lineola</i> Say.	<i>proxima</i> Say.
Group IV— <i>mutabilis</i> Newm.	<i>chrysocoma</i> Kby.
<i>aspera</i> Lec.	<i>nigrella</i> Lec.
Group V— <i>sphaericollis</i> Say.	<i>exigua</i> Newm.
	<i>americana</i> Hald.
	<i>emarginata</i> Fab.
	<i>vagans</i> Oliv.
	<i>canadensis</i> Oliv.
	<i>rubrica</i> Say.
	<i>crassipes</i> Lec.
	<i>valida</i> Lec.
	<i>vittata</i> Oliv.
	<i>nitens</i> Forst.

It is interesting to compare this arrangement with that made in this paper from a study of adult characters. The species *biforis* Newm., separated from all other larvæ of the groups I and II, which have been studied, by the presence of only one ocellus, occupies also a distinctly isolated position in the genus *Anoplodera*, in the arrangement based on adult characters. The four species in group II form part of the adult genus *Leptura*. The species *lineola* Say, forming larval group III, is placed by the writers doubtfully in the genus *Leptura*. It is obviously aberrant among the North American species of that genus. The larval group IV, *aspera* Lec. and *mutabilis* Newm., again, are considered in this paper to be an isolated group in genus *Anoplodera*, exhibiting affinities with genera in the first part of the subfamily. The writers were at one time disposed to erect three new genera for *biforis* Newm., *lineola* Say, and *aspera* Lec. and *mutabilis* Newm.; but it was finally decided to leave them for the present under the genera already mentioned. The isolated nature of their positions is well indicated in the key.

The larval group V, *sphaericollis* Say, represents the adult genus *Pidonia*.

Larval group VI does not conform to any of the arrangements that have been made from characters of the adults. In this paper the species from *bicolor* Swed. to *acuminata* Oliv. are placed in the genus *Strangalina*; *velutinus* Oliv., in the genus *Typocerus*; *exigua* Newm., in the genus *Grammoptera*; *americana* Hald., in the genus *Charasalia*; *emarginata* Fab., in the genus *Leptura*; and the remainder of the group in the genus *Anoplodera*. Larval group VI can, of course, be subdivided by definite larval characters; the question is, as to which characters should be recognized as being of primary importance. It must be recognized, also, that this interpretation of the larval affinities is based upon the study of a limited number of species.

It is perhaps hardly to be expected that the grouping made from the larval characters will, in all cases, conform to that made from adult characters. It appears reasonable to suppose that the similar habitat of the larvæ, mostly wood borers, may have checked a tendency toward divergence in characters that may have found freer expression in the adults; and, on the other hand, that the similar habitat may have resulted in convergence through the reduction of larval characters or the evolution of similar characters in groups at one time definitely separated. When larvæ of most of the species in the *Lepturini* have been studied, it may be possible to arrange larval group VI and their allies more in conformity with the grouping of the adults.

It appears evident from this comparison of larval and adult characters that a study of the larvæ will prove very helpful, if not indispensable, in determining the actual relationships of the groups.

DISCUSSION OF GENOTYPES

Acmaeops Leconte

1850. Leconte, Jour. Acad. Phila., vol. 1 (2), p. 321; Several species named, including *Leptura proteus* Kby.
 1913. Casey, Mem. Coleop., p. 219; *L. proteus* Kby. designated type. Genotype, (*Leptura*) *proteus* Kby.

Alosterna Mulsant

1863. Mulsant, Col. Fr. Long., ed. 2, p. 576; monotypic.
Genotype, (*Leptura*) *tabacicolor* DeG.

Anoplodera Mulsant

1840. Mulsant, Hist. Col. Fr., Longicornes, p. 285; including *L. sexguttata* Fab., *L. rufipes* Fab., and *L. lurida* Fab.
Genotype here designated, *Anoplodera sexguttata* Fab.

Anthophilax Leconte

1850. Leconte, Jour. Acad. Phila., vol. 1 (2), p. 326; including *viridis* Lec. and *malachiticus* Hald.
Genotype here designated (*Leptura*) *malachiticus* Hald.

Argaleus Leconte

1850. Leconte, Jour. Acad. Phila., vol. 1 (2), p. 319. Included species (*Argaleus*) *nitens* Lec. (= *Pachyta liturata* Kby.), and *Pachyta attenuata* Hald. The first species cited, *nitens* Lec., should in this case be accepted as the genotype; so that *Argaleus* Lec. becomes a synonym of *Pachyta* Dej.
Genotype here designated, *Argaleus nitens* Lec.

Bellamira Leconte

1873. Leconte, Proc. Acad. Phila., p. 328; monotypic.
Genotype, (*Leptura*) *scalaris* Say.

Centrodera Leconte

1850. Leconte, Jour. Acad. Phila., vol. 1 (2), p. 325; monotypic.
Genotype, (*Rhagium*) *decoloratum* Harris.

Charisalia Casey

1913. Casey, Mem. Coleop., p. 247.
Genotype designated by author, (*Leptura americana* Hald.).

Corymbia Des Gozis

1886. Des Gozis, L'Espece Typique, p. 33.
Genotype designated by author, "*rubra* L." Des Gozis proposed the new name *Corymbia* for the allies of *rubra* L. disregarding the earlier name *Anoplodera* Mulsant as well as Westwoods' type fixation for *Leptura* L. In this paper, *rubra* L. is considered to belong to the genus *Anoplodera* Mulsant.

Cyphonotida Casey

1913. Casey, Mem. Coleop., p. 260.
Genotype designated by author, (*Ophistomis*) *ventralis* Horn.

Encyclops Newman

1838. Newman, Ent. Mag., vol. V, p. 392; monotypic.
Genotype, *Encyclops pallipes* Newman, 1838 = (*Leptura*) *caerulea* Say, 1826.

Euryptera Serville

1825. Serville, Ency. Meth. Ins., vol. X, p. 688; monotypic.
Genotype, *latipennis* Serv.

Evodinus Leconte

1850. Leconte, Jour. Acad. Phila., vol. 1 (2), p. 325; monotypic.
Genotype, *Leptura monticola* Rand.

Gaurotes Leconte

1850. Leconte, Jour. Acad. Phila., vol. 1 (2), p. 324; monotypic.
Genotype, (*Leptura*) *cyanipennis* Say.

Grammoptera Serville

1835. Serville, Ann. Ent. Fr., vol. IV, p. 215; including *praeusta* Fab.
1840. Westwood, Insects, Gen. Brit. Ins., 41, designated as type (*Leptura*) *praeusta* Fab., 1787 (= *ustulata* Schaller, 1783).
Genotype, (*Leptura*) *praeusta* Fab.

Leptacmaeops Casey

1913. Casey, Mem. Coleop., p. 219.
Genotype, designated by author, (*Leptura*) *longicornis* Kirby.

Leptalia Leconte

1873. Leconte, Smithson. Misc. Coll., No. 264, p. 204; monotypic.
Genotype, (*Anoplodera*) *macilenta* Mannerheim.

Leptura Linné

1758. Linné, System. Nat., ed. 10, p. 397; including *4-fasciata* L. in the list of species.
1810. Latreille, Considerations Gen., p. 431; designated *Rhagium mordax* Fab. as type of *Leptura* Fab. (Designation invalid, species not in original list of Fabricius or Linné.)
1831. Curtis, British Ent., vol. VIII, p. 362; designated *elongata* DeG. 1775, as type of *Leptura* L. (Designation invalid, species not in Linné's list.)
1835. Serville, Ann. Ent. Fr., vol. IV, p. 220; described *Strangalia* including *luteicornis* Fab., 1775, and *calcarata* Fab., 1792, without designating type.
1840. Westwood, Insects, Gen. Brit. Ins., p. 41; designated *elongata* DeG.,¹ as type of *Strangalia* Serv.
1840. Westwood, Insects, Gen. Brit. Ins., p. 41; designated *Leptura 4-fasciata* L. as type of *Leptura*.

¹ = *calcarata* Fab., 1792, = *maculata* Poča. 1761 (Auriv. Cat. Col. 1912).

1861. Thompson, *Cerambyc.*, p. 153; designated *virens* L. as type of *Leptura* L. (Type already designated by Westwood.)

1886. Des Gozis, *L'Espece Typique*, p. 33; designated *rubra* L. as type of *Leptura* L. (Type already designated by Westwood.)

The species *4-fasciata* L. and *elongata* DeG. are congeneric;¹ *Leptura* L. and *Strangalia* Serv. are, therefore, synonymous and *Leptura* L. has precedence.

Genotype, *Leptura 4-fasciata* L.; designation by Westwood.

Pachyta Dejean

1821. Dejean, *Faun. Ins. Lapp.*, vol. 1, p. 376; *8-maculata* Fab. included in his list of species.

1840. Westwood designated as type (*Leptura*) *8-maculata* Fab., 1801, (= *4-maculata* L.).

Genotype, (*Leptura*) *8-maculata* Fab.

Pidonia Mulsant

1863. Mulsant, *Col. Fr. Longic.*, ed. 2, p. 570; including *Leptura lurida* Fab. and *Leptura lineata* Letz.

Genotype here designated, *Leptura lurida* Fab.

Piodes Leconte

1850. Leconte, *Jour. Acad. Phila.*, vol. 1 (2), p. 318; monotypic.

Genotype, *Piodes coriacea* Lec.

Pyrotrichus Lec.

1862. Leconte, *Proc. Acad. Phila.*, p. 41; monotypic.

Genotype, *Pyrotrichus vitticollis* Lec.

Stenocorus Geoffroy

(*Rhagium* Fabr.)

1762. Geoffroy, *Hist. Abreg. des Insects*, I, p. 221; Genus *Stenocorus* described, including *Cerambyx inquisitor* L., in his list of species.

1775. Fabricius, *Sys. Ent.*, p. 182; Genus *Rhagium* described, including *Cerambyx inquisitor* L. in his list of species.

1839. Curtis, *Brit. Ent.*, p. 750; type of *Rhagium* Fab. designated as *Leptura inquisitor* L.

1861. Thompson, *Cerambyc.*, pp. 156-7. Thompson states that Geoffroy founded *Stenocorus* on his first species, "lisse a bandes jeunes," which was subsequently given a definite name, *Stenocorus parasinus*, by Fourcroy, (*Ent. parisienne*, p. 85, 1785), and that Fabricius placed the same species in his genus *Rhagium* under the name *bifasciatum* Fabr. He, therefore, considers *Rhagium* Fabr. to be a synonym of *Stenocorus* Geoffroy, and this interpretation is apparently correct, although *parasinus* Fourcroy cannot be accepted as the type. The type of *Stenocorus* Geoff. has apparently not yet been properly designated. Geoffroy included *Cerambyx inquisitor* L. as the second species listed under *Stenocorus* and that species is hereby designated the genotype. *Rhagium* Fabr., therefore, becomes a synonym of *Stenocorus* Geoff.

Genotype here designated, (*Cerambyx*) *inquisitor* L.

¹ Aurivillius, *Cat. Col.* 1912, pp. 234, 238.

Strangalia Serville

1835. Serville, Ann. Ent. Fr., vol. IV, p. 220; described *Strangalia* including *luteicornis* Fab., 1775, and *calcarata* Fab., 1792, without designating type.
1840. Westwood, Insects, Gen. Brit. Ins., p. 41; designated *elongata* DeG.,¹ 1775, as type of *Strangalia* Serv.
1886. Des Gozis, L'Espece Typique, p. 33; designated *rubra* L. as type of *Strangalia* Serv. (Type already designated by Westwood.)
Strangalia Serv. becomes a synonym of *Leptura* L. (p. 25).

Strangalina Aurivillius

1912. Aurivillius, Coleop. Cat., pt. 39, pp. 240, 245. *Strangalina* proposed as a new name to include *attenuata* L., 1758, the first species mentioned, with *luteicornis* Fab. and its North American allies.
1921. Boppe, Gen. Insect., vol. 29, p. 102; characterized *Strangalina* Aur. with *attenuata* as the first of his list.
 Genotype here designated, *Leptura attenuata* L., 1758.

Toxotus Dejean

1821. Dejean, Cat. Coleop., p. 112; several species listed, including *meridianus* (Fabr.) L.
1840. Westwood, Insects, Gen. Brit. Ins., p. 41. Designated as type (*Cerambyx*) *meridianus* L.

This genus includes the allies of *meridianus* L. in North America.

Genotype, (*Cerambyx*) *meridianus* L.

Oxymerus Mulsant, 1863, should evidently be used for (*Cerambyx*) *cursor* L. and its allies; monotypic.

Trigonarthris Hald.

1833. Dejean, Cat. Coleop., p. 356; *Trigonotarsis*; *nomen nudum*; species included, *terminata* Dej. and *atrata* Dej., were undescribed.
1837. Dejean, Cat. Coleop., p. 383; *Trigonarthris*, = *Trigonotarsis* Dejean; *nomen nudum*.
1847. Haldeman, Trans. Am. Phil. Soc., (2), vol. 10, p. 65; *Trigonarthris* Dejean described, including *proxima* Say and (*atrata* Dejean); monotypic.
1850. Leconte, Jour. Acad. Phila., (2), vol. 1, p. 339; *atrata* Dej. described.
 Genotype, (*Leptura*) *proxima* Say.

Typocerus Leconte

1850. Leconte, Jour. Acad. Phila., (2), vol. 1, p. 233.
1913. Casey, Mem. Coleop., p. 248; designated as genotype (*Leptura*) *velutina* Oliv.
 Genotype, (*Leptura*) *velutina* Oliv.

Xylosteus Frivoldszky

1838. Frivoldszky, Magyar Tud. Tars. Evkon., vol. 3, p. 180.
 Genotype, *Xylosteus spinolae* Friv., 1838; monotypic.

¹ = *calcarata* Fab., 1792, = *maculata* Poda, 1761 (Auriv. Cat. Col. 1912).

KEY TO THE GENERA OF THE LEPTURINI OF AMERICA NORTH OF MEXICO

THE TRIBE LEPTURINI¹ (FAMILY CERAMBYCIDÆ)

This group is separated from the rest of the Cerambycidae by the following characters: forecoxae conical; base of antennae not enveloped by the eyes; mandibles acute and fringed on the inner margin; elytra not abbreviated.

- A Prosternum broadly excavated across the middle, pronotum spinose to subtuberculate on the sides; first segment of the hind tarsi with a pubescent sole beneath.
- B Front of head vertical, front and vertex meeting at an angle of nearly 90 degrees.
 - C Tarsi stout, hind tarsus with 2nd segment not longer than 3rd; intercoxal piece of prosternum strongly elevated, width moderate. *Pyrotrichus* Lec.
 - CC Tarsi slender, hind tarsus with 2nd segment longer than 3rd; intercoxal piece of prosternum feebly elevated and very narrow.
 - D Hind tarsus with 1st segment pubescent on the sides beneath, middle line glabrous; cheeks moderate, length between eye and base of mandible about one-half diameter of eye; palpi long and slender. *Leptalia* Lec.
 - DD Hind tarsus with 1st segment pubescent beneath throughout; cheeks much shorter than half diameter of eyes; palpi short and stout. *Encyclops* Newm.
- BB Front of head oblique, meeting vertex at an angle of much more than 90 degrees.
 - C Tibial spurs not terminal. *Toxotus* Dej. (*Stenocorus* Fabr.)
 - CC Tibial spurs terminal.
 - D Hind wings with a closed cell in the anal region.
 - E Antennae short, segments 5 to 11 much stouter than 1 to 4; elytra strongly costate. *Stenocorus* Geoff. (*Rhagium* Fabr.)
 - EE Antennae usually slender, distal segments but little stouter than the others.
 - F Eyes coarsely granulated.
 - G Eyes large, prominent. *Centrodera* Lec.²
 - GG Eyes of moderate size. *Xylosteus* Friv.
 - FF Eyes finely granulated.
 - G Pronotum with sides distinctly tuberculate.
 - H Eyes large, emarginate.
 - I Third segment of hind tarsus cleft to the base. *Anthophilax* Lec.
 - II Third segment of hind tarsus cleft approximately to the middle. *Pachyta* Dej.
 - HH Eyes small, entire. *Piodes* Lec.
 - GG Pronotum with sides obtusely rounded at the middle. *Leptacmaeops* Csy.³
 - DD Hind wings without a closed cell in the anal region.
 - E Pronotum with sides strongly tuberculate; antennae short and stout. *Pseudopachyta* n. gen.
 - EE Pronotum with sides obtusely rounded or feebly tuberculate in front of the middle.
 - F Metepisternum broad at base with sides converging behind.
 - G Eyes distinctly emarginate. *Evodinus* Lec.
 - GG Eyes entire.
 - H Pronotum and elytra polished, feebly punctate, almost devoid of pubescence. *Gaurotus* Lec.
 - HH Pronotum and elytra closely strongly punctate and distinctly pubescent. *Acmaeops* Lec.

¹ Including the *Encyclopini* and *Lepturini* of Leconte.

² The genus *Centrodera* Lec. is doubtfully distinct from *Xylosteus* Friv.

³ *Leptacmaeops* Csy. is probably synonymous with *Cortodera* Muls. of Europe. The European material before us is insufficient to enable us to form a definite conclusion.

- FF Metepisternum narrow throughout with sides parallel; eyes deeply emarginate.
- G Cheeks before the eyes very short, almost linear; forecoxal cavities widely open behind, intercoxal piece very thin, not widened behind; last ventral segment of male more or less excavated. *Pidonia* Muls.
- GG Cheeks nearly as long as width of mandibles at the base; forecoxal cavities nearly closed behind with intercoxal piece widened behind; last ventral segment of male normal. *Idiopidonia* n. gen.
- AA Prosternum convex, sulcate only near the anterior margin; prothorax not tuberculate on the sides, rarely strongly angulate (as in *L. proxima* Say).
- B Pronotum with hind angles acutely produced over the humeri; without a strong basal constriction, so that the line which forms the side margin of the pronotum is continued as the side margin of the elytra.
- C Pronotum campanulate; 1st segment of hind tarsus with pubescent sole; forecoxal cavities open behind; sides of elytra parallel.
- D Antennæ without poriferous impressed areas; 3rd hind tarsal segment cleft nearly to the base; transverse dorsal impression behind the eyes separating head from neck very feeble. *Grammoptera* Serv.
- DD Antennæ with poriferous impressed areas; 3rd hind tarsal segment cleft only to the middle; transverse dorsal impression separating head from neck abrupt and distinct. *Alosterna* Muls.
- CC Pronotum trapezoidal; 1st segment of hind tarsus usually without a pubescent sole.¹
- D Elytra cuneiform.
- E Antennæ with segments 5 to 11 inflated and distinctly wider than 3 and 4; pronotum polished and nearly impunctate, with the hind angles subacute.
- F Elytra dehiscent and rounded at the apex, front of head very short; pronotum wider than long, and very narrowly constricted in front. *Pseudostrangalia* n. gen.
- FF Elytra hardly dehiscent, broadly subtransversely truncate at apex; front of head very elongate; pronotum longer than wide, rather broadly constricted in front. *Cyphonotida* Csy.
- EE Antennæ with distal segments 5 to 11 not inflated; pronotum strongly punctured, with hind angles acute or laminate.
- F Labial palpi with terminal segment short and wide, length approximately twice the width, usually truncate at the apex.
- G Form of body only moderately slender, with elytra not attenuate on caudal half and lateral margins nearly straight; pronotum narrowly constricted in front.
- H Distal segments of antennæ without distinct, poriferous areas, rarely with definite pits on distal extremities. *Leptura* L. (*Strangalia* Serv.)
- HH Distal segments of antennæ with large, distinct, poriferous areas. *Typocerus* Lec.
- GG Form of body very slender, elytra attenuate on caudal half and strongly sinuate on lateral margins, abdomen extending far behind elytra.
- H Front of head very short, length from front of eyes to base of mandibles much less than half the width; pronotum very broadly sulcate in front across the dorsum; male with terminal segments of abdomen inflated and strongly excavated beneath. *Bellamira* Leconte.
- HH Front of head of moderate length, from front of eyes to base of mandibles not less than half the width; pronotum subcampanulate, not broadly sulcate across the dorsum; male with terminal segments not inflated, sulcate beneath. Genotype (*Strangalia*) *delicata* Lec. *Neobellamira* n. gen.

¹ See page 4.

- FF Labial palpi with terminal segment slender, length much more than twice the width; form of body very slender, elytra attenuate on caudal half; male with terminal segment of abdomen excavated. *Strangalina* Auriv.
- DD Elytra with sides parallel to subinflated behind.
- E Eyes small, length much less than distance between front of eyes and tips of mandibles; tempora strongly inflated; antennæ normal. *Charisalia* Csy.
- EE Eyes very large, length about equal to distance from front of eyes to tip of mandibles; tempora oblique, hardly inflated; antennæ stout. *Euryptera* Serv.
- BB Pronotum campanulate to quadrate, with hind angles not prolonged over the humeri, acute, subacute, or laminate, or obtusely rounded. *Anoplodera* Muls.

PSEUDOPACHYTA new genus

Antennæ short and moderately stout; inserted well before the eyes; eyes not emarginate; terminal segments of palpi short and clavate; front of head oblique; prosternum broadly excavated; pronotum with sides strongly tuberculate; hind wings without a closed cell in the anal region; elytra with longitudinal and transverse rugosities cribrate; tibial spurs terminal; the first hind tarsal segment with the usual pubescent sole; form stout, not cuneiform. Genotype, (*Pachyta*) *rugipennis* Newm.

Pseudopachyta rugipennis Newm., 1844, The Zoologist, p. 476.

Length 10 to 16 mm.; dark coppery brown, legs and antennæ dusky reddish; pronotum wider than long in the female, nearly square in the male, base much wider than the apex, sides strongly tuberculate; elytra very strongly cribrate, the anastomosing ridges shining, with a narrow, pale yellow, obliquely transverse, irregular, median vitta on each elytron, directed caudad from the lateral margin to the suture, neither of which is quite attained.

Twenty specimens are before us from Hull, Que.; Bathurst, N.B.; Frater, Ont., and Ottawa, Ont. In literature, Nova Scotia and Maine are cited.

Host plant: "Dead pine."

Type locality: Canada.

PIDONIA Mulsant

1863, Col. Fr., Longic., (ed. 2), p. 570.

Haplosalia Csy., 1913, Mem. on the Coleop., vol. IV, p. 200.

Thesalia Csy., 1913, Mem. on the Coleop., vol. IV, p. 198.

Head abruptly and strongly constricted far behind the eyes; pronotum broadly biconstricted, anteriorly and basally, but little narrower in front than behind, sides inflated and subangulate at the middle, basal angles strongly rounded; pronotum hardly more than half the width of elytra at base; metepisternum very slender, sides gradually converging caudad; pubescent sole distinct on first three segments of hind tarsi; intercoxal process of the prosternum hardly attaining the caudal margin, not thickened behind, coxal cavities widely open behind; prosternum broadly transversely excavated; last ventral segment of the male usually excavated. Genotype, *Leptura lurida* Fab.

KEY TO THE SPECIES

- A Pronotum with anterior and basal constrictions feebly impressed, coarsely and rather sparsely punctured; elytra very coarsely and very deeply punctured; colour reddish testaceous; antennæ very stout.
(*Thesalia* Csy.).
(1) *gnathoides* Lec.
- AA Pronotum with anterior and basal constrictions strongly impressed, punctation small and dense to nearly obsolete; antennæ slender.
- B General colour of body reddish, with lateral and sutural black vittæ on elytra; last ventral segment of male feebly excavated at apex and not spinose.
(2) *aurata* Horn.
- BB General colour of body black; elytra black, or testaceous and black; last ventral of male very deeply excavated and bispinose.
- C Pronotum and head polished, minutely and sparsely punctate.
- D Elytral punctation moderate, becoming minute on the apices.
(3) *ruficollis* Say.
- DD Elytral punctation very coarse on the cephalic half, becoming rather small on the apices.
(4) *straussi* Webb.
- CC Pronotum and head closely to very densely punctate.
- D Elytra testaceous, marked with arcuate sutural and straight, lateral, black vittæ approximate or fused at the apical fourth, variably complete.
(5) *scripta* Lec.
- DD Elytra black, each with a pale yellowish, median, longitudinal vitta.
(6) *densicollis* Csy.

(1) *Pidonia gnathoides* Lec., 1874, Smith. Misc. Coll., vol. XI, No. 264, p. 228.

Acmaeops lisa Leng., 1890, Ent. Am., vol. 1, p. 108.

rubriceps Csy., (*Thesalia*) 1913, Mem. on the Coleop., vol. IV, p. 198.

Length 8 mm. Mr. Charles Schaeffer¹ remarks: "I possess through the kindness of my friend, Mr. Charles W. Leng, a specimen of his *Acmaeops lisa* from Dunsmuir, California, which differs only from the type in having on each elytron a small black spot. It agrees exactly with a specimen of *Leptura gnathoides* from Tulare county, California, except that the thorax and underside are black."

A male and female before us each has a black spot midway on the sides. Of four specimens in the United States National Museum collection, Washington, from Washington state and California, two have the black spots and two are without them. The elytral vestiture of the female is noticeably finer and shorter, giving it a more shining appearance.

The type of *rubriceps* Casey differs from our compared specimen of *gnathoides* in being longer and narrower, with longer antennæ, and with the pronotum somewhat more strongly tuberculate on the sides. It may eventually prove to be distinct.

Six specimens examined, from Mariposa and Eldorado counties, California, and Washington state. In literature Oregon is also given.

Type locality: Oregon, type a male.

(2) *Pidonia aurata* Horn, 1869, Proc. Acad. Phila., p. 570.

Length 8 to 10 mm. The colour is pale reddish with a sutural and sublateral black vitta on each elytron, variable in width, the sublateral vitta in some cases widened behind.

Thirty-two specimens were examined from North Carolina, Pennsylvania, and Virginia.

Type locality: Alleghany Ridge, western Virginia.

¹ Bull. Brook. Inst., 1, 1908, p. 342.

- (3) *Pidonia ruficollis* Say, 1824, Jour. Acad. Phila., vol. III, p. 421.
vibex Newm., 1841, Ent., p. 72.
 var. *fragilis* Csy., 1913, Mem. on the Coleop., p. 202.
sphaericollis Say, 1826, Jour. Acad. Phila., vol. V, p. 280.
discicollis Dej., 1837, Dej. Cat., p. 383.
lineicornis Csy., 1913, Mem. on the Coleop., p. 201.
allecta Newm., 1841, Ent., p. 72.
laeviceps Csy., 1913, Mem. on the Coleop., p. 266.
collaris Melsh., in litt.
paupercula Newm., 1841, Ent., p. 72.
nitidicollis Horn, 1860, Proc. Acad. Phila., p. 570.

Length 6 to 9 mm. *L. ruficollis* Say was described in 1824 and *L. sphaericollis* Say in 1826. Say, in his original description of *L. sphaericollis*, says that it differs from *L. ruficollis* chiefly in the colour of the prothorax.

Mr. Frank Morris, of Peterborough, Ontario, informs us that the individuals with red prothorax are in many cases found mating with those with the black prothorax, and that the red prothorax is common when they first emerge, turning darker as the season advances, finally becoming black; this is also in many cases true of the bicoloured legs. Mr. Morris supplied us with intermediate colour forms grading from red to piceus black on the prothorax. We have been unable to find satisfactory characters differentiating these two forms; colour alone is, in our opinion, rarely of specific value in this group, especially when every intermediate shade is found in the same locality. Our Canadian specimens do not differ from those of North Carolina, even in size. The male has the last ventral very deeply broadly emarginate.

We can distinguish *vibex* Newm. from *ruficollis* Say only by the presence of longitudinal yellow vittæ on the elytra, and these, on more than one specimen before us, are almost obsolete. On one specimen the vitta occurs on one elytron and not on the other. Several individuals of the form *sphaericollis* also show a faint indication of similar vittæ. We can, therefore, find no justification for separating *vibex* Newm. from *ruficollis* Say.

The single type of *H. lineicornis* Csy. has the pronotum more strongly inflated at the sides than usual, and the antennæ with the 3rd and 4th segments subequal and shorter than the 5th. We would not separate it from *ruficollis* on the basis of this one specimen. *H. laeviceps* Csy. is a stout female with antennæ as long as the body.

One hundred and thirty-two specimens examined from North Carolina, Pennsylvania, Massachusetts, Connecticut, New York, Ontario, and Quebec. Virginia and Indiana are also cited in literature.

Type locality of *L. ruficollis* Say: Kentucky.

Type locality of *L. sphaericollis* Say: Salem, Mass.

Type locality of *L. vibex* Newm.: Trenton Falls, N.Y.

- (4) *Pidonia straussi* Webb., 1908, Proc. Ent. Soc. Wash., vol. IX, p. 41.

This species has the prothorax red and the elytral markings like the *vibex* colour form of *ruficollis* Say. It differs in the smaller size, stouter form, and very much coarser elytral punctation. One specimen before us, probably this species, has the prothorax very dark red, almost black.

Six specimens in the type series have been studied.

Type locality: Tryon, North Carolina.

- (5) *Pidonia scripta* Lec., 1869, Ann. Nat. Hist., vol. IV, p. 384.

Length 6 to 9 mm. This species is exceedingly variable in colour and maculation. The pronotum may be black, reddish, or reddish with the disk black. The colour design of the elytra is, typically, yellow with an elongate S-shaped, black marking on the basal two-thirds of each elytron; this black marking is usually incomplete, variably broken into spots and lines, and in some individuals is almost obsolete. The femora are testaceous, variably blackened apically.

A short series of specimens, taken by Dr. F. E. Blaisdell in the coast region north of San Francisco, have the elytra more coarsely punctured, but are probably only a local variation.

Ninety-eight specimens have been examined from California, Oregon, Washington, and British Columbia. In British Columbia this species is very common on the blossoms of the wild rose. It has also been found in Nevada.

Type locality: Vancouver island, B.C.

- (6) *Pidonia densicollis* Csy., 1914, Mem. on the Coleop., vol. V, p. 366.

Although known to us only through the type in the Casey collection, this is considered as probably a valid species. It is closely allied to *ruficollis* Say, but has the head and pronotum very densely punctured throughout and finely granulate.

Type locality: North Carolina (Black mountains).

IDIOPIDONIA new genus

Allied to *Pidonia* Mulsant, differing chiefly in having the intercoxal piece of the prosternum widened behind, and the forecoxal cavities nearly closed behind; the cheeks between the eyes and the base of the mandibles nearly as long as the width of the mandibles at the base, and the last ventral of the male not excavated. The prosternum is transversely, broadly impressed and striate, and the first segment of the hind tarsus is densely pubescent beneath. Genotype, (*Leptura*) *pedalis* Leconte.

Idiopidonia pedalis Lec., 1861, Proc. Acad. Phila., p. 355.

Length 8 to 11 mm. This species has the peculiar inflated pronotum common to the species of *Pidonia*, from which it differs by the characters given in the preceding paragraph. The body and elytra are black with the last ventral segment in some cases reddish. The legs are reddish-testaceous, black or bicoloured, the antennæ variably annulated.

Seven specimens examined from New York, New Hampshire, Michigan, New Brunswick, and Ontario. Mr. Leng cites "Anticosti."

Type locality: "Lake Superior."

GRAMMOPTERA Serville

1835, Ann. Soc. Ent. France, vol. IV, p. 215.

Parallelina Csy., 1913, Mem. on the Coleop., p. 247.

Prothorax campanulate, hind angles acute and moderately produced; elytral apices evenly rounded; metepisternum very slender; forecoxal cavities widely open behind; 1st segment of hind tarsus with distinct pubescent sole; prosternum convex. Genotype, (*Leptura*) *praeusta* Fab.

KEY TO THE SPECIES

- A Cheeks moderate; intercoxal piece of prosternum feebly widened behind; pronotum with sides strongly narrowed on apical half, usually wider than long, pronotum and elytra black. (1) *campanifera* Csy.
- AA Cheeks very short, linear; intercoxal piece of prosternum not widened behind.
- B Tempora hardly at all inflated, abruptly, obliquely narrowed backward from the eyes as viewed from above; pronotum and elytra bright blue, in some cases with red elytral humeri; pronotum usually longer than wide. (2) *molybdica* Lec.
- BB Tempora distinctly inflated, strongly arcuate, or angulate as viewed from above.
- C Pronotal disk with median line broadly feebly impressed; vestiture on head and pronotum reddish golden.
- D Last ventral of female stout, subopaque, with a median apical spine; last ventral of male subtruncate, broadly rounded at apex; pronotum black, with or without reddish margins. (3) *exigua* Newm.
- DD Last ventral of female without apical spine; last ventral of male narrowly rounded at apex; pronotum red. (4) *haematites* Newm.
- CC Pronotal disk strongly convex, hardly at all impressed along median line; vestiture of entire body yellowish grey.
- D Pubescence of elytra very short and inconspicuous.
- E Pronotum with punctures densely placed. (5) *subargentata* Kirby.
- EE Pronotum with punctures coarse and sparse. (6) *rhodopus* Lec.
- DD Pubescence of elytra rather long, cinereous, and conspicuous.
- E Punctures of pronotum coarse and sparse; hind tibial spurs short and slender, about one-fourth the length of the 1st tarsal segment. (7) *ruficeps* Lec.
- EE Punctures of pronotum densely placed; hind tibial spurs elongate, about one-third the length of the 1st tarsal segment. (8) *filicornis* Csy.

(1) *Grammoptera campanifera* Csy., 1913, Mem. on the Coleop., p. 256.

Length 8 mm. Doctor F. E. Blaisdell very kindly loaned us a specimen from the type series, taken at the same time as Col. Casey's type.

The only male we have seen is narrower than the females, not so convex, with parallel elytra and red or bicoloured legs, as have three of the females; in the other females the legs are black.

In all, seven specimens have been studied, in addition to the type, five from Fresno and Tulare counties, California, one from Cayton, Shasta county, California, and one from the type locality. The female will probably be found in some collections under the name *Acmaeops cubitalis*; but the shape of the prothorax, with the basal angles moderately produced and acute, and elytra with rounded apices, require its inclusion in this genus. It is closely related to the European *Grammoptera variegata* Germ.

Habitat: Sierra Nevada mountains, California.

Type locality: Mokelumne hill, Calaveras county, California.

(2) *Grammoptera molybdica* Lec., 1850, Jour. Acad. Phila., (2), vol. 2, p. 101. *militaris* Chev., 1855, Rev. Zool., p. 187.

Length 5 to 6 mm. This is a slender, blue species, common in California on *Ceanothus* blossoms, especially on *Ceanothus divaricatus*; it is taken occasionally in British Columbia, and is probably found in Washington and Oregon. The form *militaris* can be distinguished only by the red humeri of the elytra and seems to be confined to central and southern California. In southern California the blue form is found commonly at very high elevations, and the form *militaris* at very low elevations; between these extremes is a transition belt, at from 3,000 to 6,000 feet, where both forms are common. Mr. Hopping has frequently taken numerous pairs of both forms from the same bush; but has never seen the *militaris* form mating with typical *molybdica*.

We cannot separate these forms by any constant characters, other than the red humeri and, although they may eventually prove to be distinct, they are left in this paper, tentatively, under the name *molybdica* Lec.

Thirty typical *molybdica* have been before us, from California and British Columbia, and forty-eight of the form *militaris*, all from California. Other localities given in literature: Nevada and Oregon.

Type locality of *militaris*: "Rocky mountains."

Type locality of *molybdica*: "San Francisco."

- (3) *Grammoptera exigua* Newm., 1841, Ent., p. 73.

nana Newm., 1841, Ent., p. 73.

saucia Lec., 1862, Proc. Acad. Phila., p. 40.

Length 4 to 7 mm. The short, almost quadrate prothorax, feebly margined apically, and reddish golden pubescence of the pronotum, distinguish this species from the *subargentata* group. The pronotum may be entirely black or black with red margins. The legs are variously bicoloured or black.

Fifty-nine specimens have been examined from New York, Massachusetts, Pennsylvania, Michigan, Quebec, and Ontario.

Type locality: Trenton Falls, N.Y.

- (4) *Grammoptera haemetites* Newm., 1841, Ent., p. 73.

Length 3 to 6 mm. This species may generally be distinguished by the entirely red prothorax and the absence of the tubercle on the last ventral of the female. The legs are variously bicoloured, a common character in several species of this group, and not, apparently, of specific importance.

Thirteen specimens are before us from North Carolina, Pennsylvania, Massachusetts, New York, Quebec, and Ontario. In literature, Illinois is cited.

Type locality: Trenton Falls, N.Y.

- (5) *Grammoptera subargentata* Kirby, 1837, Faun. Bor. Am., vol. 4, p. 184.

similis Kirby, 1837, Faun. Bor. Am., vol. 4, p. 185.

rufibasis Lec., 1862, Proc. Acad. Phila., p. 40.

Length 6 to 8 mm. Several species are generally included under this name in collections. Mr. C. A. Frost and Dr. Nathan Banks very kindly compared selected specimens with the type and homotypes in the Leconte collection. Based on these comparisons and a subsequent study of the Leconte collection by the writers the synonymy given above has been adopted. The inconspicuous vestiture of the elytra, which are rather strongly shining, separate *subargentata* from the other species of the group, except *rhodopus*. The legs may be variously bicoloured or entirely black.

Thirty-seven specimens are before us, many of them from the vicinity of the type locality. The localities represented are: British Columbia, Alberta, Manitoba, Ontario, Quebec, and Ohio. In literature Alaska is cited.

Type locality: Canada, latitude 65 degrees.

- (6) *Grammoptera rhodopus* Lec., 1874, Trans. Am. Ent. Soc., p. 68.

Length 6.5 mm. An examination of the type in the Leconte collection has convinced us that this species is distinct. The pronotum has the sides subparallel from the base to beyond the middle, arcuately narrowed, not

inflated in front, the disk rather coarsely, sparsely punctate with the interspaces distinct; the elytra rather coarsely, moderately closely punctate, not granulate; elytra and pronotum much more coarsely punctate than in *subargentata*; the legs bright yellowish red.

The type series, two males, were studied.

Type locality: "Cala."

(7) *Grammoptera ruficeps* Lec., 1862, Proc. Acad. Phila., p. 40.

Length 4 to 6 mm. The legs of this species are generally bicoloured, the mouth parts and scape of antennæ red, with pronotum black. The tibial spurs are short. *Grammoptera ruficeps* seems to be closely related to *Grammoptera ruficornis* of Europe.

Ten specimens are before us from Massachusetts, New Brunswick, Ontario, and Manitoba.

The type locality is given as "Upper Georgia," in the Leconte collection.

(8) *Grammoptera filicornis* Csy., 1913, Mem. on the Coleop., p. 255.

Length 6 to 8.5 mm. In the numerous specimens before us from Colorado and British Columbia, the colour is consistently black, including the legs. The elytral vestiture is longer and more conspicuous than in any allied species. In Colorado it commonly occurs on a species of wild geranium and in British Columbia it is very numerous on the wild rose.

One hundred and ten specimens have been examined in this study from Colorado, New Mexico, and British Columbia.

Type locality: Washington.

ALOSTERNA Mulsant

1863, Col. Fr. (ed. 2), p. 576.

The pronotum is elongate, inflated in front of the middle, the hind angles only feebly produced; the pubescent sole well developed on the first three segments of the posterior tarsi; the cheeks somewhat shorter than the width of the mandibles at the base; the antennæ with distinct poriferous impressions, in the form of grooves or distinct pits on the distal segments from the 6th to the 11th; the prosternum convex, the forecoxal cavities narrowly open behind; and the head is separated from the neck by an abrupt transverse impression across the dorsum behind the eyes. Genotype, (*Leptura*) *tabacicolor* DeG.

The Californian species, *rubida* Lec., has heretofore occupied an indefinite position in the genus *Anoplodera*; but it is evidently congeneric with the European species, *tabacicolor* DeGeer of the genus *Alosterna* Mulsant, with which it agrees particularly in the impressed antennal segments and the peculiar shape of the pronotum.

Three exotic species are known, *A. elegantula* Kratz from China, *A. scapularis* Heyden from Persia, and *A. tabacicolor* DeGeer from Europe and Siberia. Specimens of *tabacicolor* are before us. The species *chalybae* Hald., *capitata* Newm., and *keeni* Csy. are closely allied to *rubida* and are included here in *Alosterna*; *chalybea* may eventually be separated as a distinct genus.

KEY TO THE SPECIES

- A Antennæ with 3rd segment hardly longer than the 4th; segments 6 to 11 distinctly stouter than segments 2 to 5; the poriferous areas as oval spots, one on each segment; cheeks very short; colour blue. (1) *chalybea*.
- AA Antennæ with 3rd segment much longer than 4th; distal segments slender; poriferous areas as grooves or series of pits; cheeks moderate; colour black and reddish.
- B Antennæ with poriferous areas a series of pits; pronotum shining, feebly punctured, shorter than the width and very strongly convex; body and elytra black, head and pronotum red. (2) *capitata* Newm.
- BB Antennæ with poriferous areas in the form of grooves; pronotum opaque, deeply, closely punctured, distinctly longer than the width and only moderately convex; body, head, and pronotum black, elytra reddish.
- C Elytra closely punctured, lustre subopaque, colour dull red; pubescence of pronotum and elytra rather long and conspicuous; proepisternal area closely punctate, moderately excavated, strongly punctate behind the coxæ. (3) *rubida* Lec.
- CC Elytra sparsely punctured, lustre shining, colour bright red; pubescence of pronotum and elytra very short and inconspicuous; proepisternal area sparsely punctate, very deeply excavated, very sparsely punctate behind the coxæ. (4) *keeni* Csy.

(1) *Alosterna chalybea* Hald., 1853, Trans. Am. Phil. Soc., vol. X, p. 60.

Length 6 mm. This small, stout species can easily be distinguished by its blue colour and the straight basal margins of the elytra. It is apparently rare in collections. We have never seen a specimen from Canada. Three specimens before us are from Ohio and Pennsylvania. Other localities mentioned in literature: Canada, New York, North Carolina, and Iowa. Six specimens in the Leconte collection are from the Central States and Illinois.

Type locality: Pennsylvania.

(2) *Alosterna capitata* Newm., 1841, Ent., p. 71.
sanguinicollis Dej., 1837, Dej. Cat., p. 383.

Length 7 to 9 mm. The apices of the elytra vary considerably, but are usually distinctly subtruncate. The prothorax has been constantly reddish in all the specimens we have seen. The basal angles are acute, only moderately produced, but fit over the humeri to form a continuous outline; the proepisternal area is sparsely and feebly punctate.

Seventy-two specimens have been examined from New York, Ontario, and Quebec; other localities mentioned in literature: New Hampshire, Pennsylvania, Michigan, Iowa, Ohio, Georgia, Montana, and Massachusetts.

Type locality: Trenton Falls, New York.

(3) *Alosterna rubida* Lec., 1873, Smith. Misc. Coll. (264), pt. II, p. 224.

Length 10 to 12 mm. This species can be distinguished readily from all other North American species except *keeni* Csy. by the characters given in the key. The distal segments of the antennæ, bearing the poriferous grooves, are but little enlarged, the elytra are closely punctured, subopaque, and fulvous, and both pronotum and elytra are distinctly hairy; the proepisternal area is closely punctured, moderately excavated, strongly punctate behind the coxæ.

Ten specimens of *rubida* and *keeni* have been before us and others have been examined in other collections. The distribution of *rubida* in this material is in California and Oregon.

Type locality: California.

(4) *Alosterna keeni* Casey, 1913, Mem. on the Coleop., vol. IV, p. 257.

Length 12 mm. This species is apparently distinct from *rubida* Lec. In the collections we have seen, *keenii* has red and more sparsely punctured elytra, with pronotum and elytra clothed only with short and inconspicuous pubescence; the pronotum more strongly widened behind and in our specimens the proepisternal area definitely more sparsely punctate and much more deeply excavated. The lustre is distinctly shining. It is possible that in a large collection these characters will be found to intergrade.

The type and three other specimens have been examined from California, Oregon, and British Columbia.

Type locality: Inverness, British Columbia.

PSEUDOSTRANGALIA new genus

This genus has heretofore been included in *Strangalia*. The form is depressed, front of the head short, cheeks shorter than the width of the mandibles at the base, eyes very large, antennæ as long as the body, with segments 5 to 11 slender, distinctly longer than 3; pronotum polished, the hind angles broadly produced outward and obtuse; scutellum very slender; base of the elytra bilobed, with prominent humeri, apices strongly dehiscent, and arcuate on the sutural angle; the last dorsal segment (♀) wide, very broadly arcuate and spatulate at the apex; metepisternum slender, widened at the base; 1st and 2nd hind tarsi without pubescent sole; forecoxal cavities closed behind. Genotype, (*Leptura*) *cruentata* Hald.

Pseudostrangalia cruentata Hald., 1847, Trans. Am. Phil. Soc., (2), vol. 10, p. 64.

maneei Csy., 1914, Mem. on the Coleop., p. 367.

Length 9 to 10 mm. The apices of the elytra are not emarginate, the sutural angle being rounded and the outer angle acute. It seems to be widely distributed but rare in collections. It may be easily recognized by its short form, red and black coloration, and strongly dehiscent elytral apices. The dorsal surface is shining, the pronotum smooth, minutely, sparsely punctured, the elytra coarsely, deeply punctured, more finely towards the apex; the colour black with abdomen, metasternum, proximal two-thirds of hind femora, and lateral and apical margin of elytra red.

The type of (*Strangalia*) *maneei* Csy. differs from typical *cruentata* Hald. only in having the elytra more coarsely and sparsely punctured, the pronotum more sparsely punctured, and less red on the elytra. It is left here under *cruentata* but may prove to be distinct.

Three specimens are before us from Iowa and Illinois. Other localities cited in literature: Pennsylvania, Georgia, Texas, "Can." (Ontario?), Indiana, and North Carolina.

Type locality: Pennsylvania.

LEPTURA Linn.

1758, Syst. Nat., ed. 10, p. 397.

Strangalia Serv., 1835, Ann. Soc. Ent. Fr., vol. IV, p. 220.*Stenura* Dej., 1837, Dej. Cat., ed. 3, p. 381.*Stenura* Gangl., 1881, Best. Tab., 47, p. 18.

Pronotum with hind angles prolonged and acute, subcampanulate or trapezoidal; head constricted shortly behind the eyes; apices of elytra usually emarginate and bidentiform, elytra cuneiform; forecoxal cavities usually narrowly open behind; wings with closed cell in radial sector very elongate; of comparatively large size and elongate form. Genotype, (*Leptura*) *quadrifasciata* L.

KEY TO THE SPECIES

- A Metepisternum with sides converging regularly from base to apex; antennæ serrate; elytra rufous; very large species, length about 25 to 35 mm.
 - B Prothorax densely punctured; elytra strongly sulcate. (1) *gigas* Lec.
 - BB Prothorax rather sparsely punctured; elytra at most only faintly sulcate. (2) *emarginata* Fab.
- AA Metepisternum with sides subparallel on basal half; antennæ filiform; smaller species, about 10 to 20 mm. in length.
 - B Pronotum trapezoidal, sides converging feebly from base to apex; subangulate in front of middle, but little narrowed at apical margin; elytra red, black, or bicoloured, length 18 to 19 mm. (3) *anthracina* Lec.
 - BB Pronotum campanulate, the sides distinctly rounded and narrowed on the apical fifth.
 - C Elytral apices very strongly dehiscent.
 - D Elytral apices very strongly oblique and emarginate; pronotum with caudal transverse impression deeply excavated across the dorsum; front coxal cavities closed or narrowly open behind.
 - E Pronotum nearly as wide as the elytra at the base; pubescence short and decumbent; stout species. (4) *abdominalis* Hald.
 - EE Pronotum distinctly narrower at the base than the elytra; with pubescence elongate and erect, finely punctured; slender species (♂ only). (5) *kerniana* Fall.
 - DD Elytral apices subtransversely truncate; pronotum with the caudal transverse impression feeble, disk rather coarsely punctured, median line on the disk narrowly impressed; front coxal cavities rather widely open behind. (6) *plagifera* Lec.
 - CC Elytral apices at most only feebly dehiscent.
 - D Pronotum with disk only moderately convex, with median line distinct; elytra finely closely punctured, apices obliquely truncate-emarginate.
 - E Pronotum with the caudal transverse impression feeble across the dorsum, the median line distinctly impressed only toward the base, pronotum at the base much wider than the middle, punctures very fine and dense; elytra bicoloured, black and testaceous, the suture, lateral margin, apices, and a median transverse spot or band black. (7) *subhamata* Rand.
 - EE Pronotum with the caudal transverse impression deeply excavated across the dorsum, the median line distinctly, usually rather broadly, impressed.
 - F Elytra unicolorous; punctation of pronotum very fine, and feebly impressed, elytra black or testaceous with tips black; size small, slender. (8) *plebeja* Rand.
 - FF Elytra maculate, punctation of pronotum of moderate size and deeply impressed.
 - G Antennæ black and very slender; prothorax black, *body and legs slender*, punctation of the elytra of moderate size and only moderately close, with two lateral spots and apices black. (9) *propinqua* Bland.

- GG Antennæ usually annulated, body and legs stout, prothorax with sides usually testaceous; punctation of the elytra usually smaller and closer.
- H Pronotum with the pubescence on the sides erect and usually long with rather numerous flying hairs, median line broadly impressed. (10) *obliterata* Hald.
- HH Pronotum with the pubescence on the sides short and recumbent, with very few flying hairs, the median line narrowly impressed and sulcate at the base. (11) *deleta* Lec.
- DD Pronotum with disk very strongly convex, without impressed median line; elytra coarsely not closely punctured, apices almost transversely truncate and feebly emarginate, form very slender. (12) *lineola* Say.

- (1) *Leptura gigas* Lec., 1874, Sm. Misc. Coll., vol. XI, No. 264, p. 223.

Length 31 to 35 mm. The strongly costate elytra, usually tipped with black, distinguish this species from *emarginata* Fab.

We can see no reason for excepting *gigas* and *emarginata* from this genus.

Two specimens were examined, both from Texas. New Mexico has also been cited in literature.

Type locality: Texas.

- (2) *Leptura emarginata* Fab., 1787, Mant. Ins., vol. 1, p. 148.

Length 30 mm. This species and *S. gigas* Lec. are the largest in the group. The elytra are velvety red, not costate or only very feebly so, with the apices black in some cases for a third of the elytral length.

Eight specimens have been examined from New Jersey, Alabama, Texas, Kentucky, Pennsylvania, and Tennessee. In literature, Canada and North Carolina are cited.

Host plants: *Castanea* (Blatchley), *Ulmus* (Felt), *Fagus*, *Quercus*, *Betula* (Craighead).

Type locality: Cajannae (Cayenne).

- (3) *Leptura anthracina* Lec., 1875, Trans. Am. Ent. Soc., vol. 5, p. 174.
subcostata Fall, 1907, Trans. Am. Ent. Soc., vol. 33, p. 249.

Length 18 to 19 mm. Pronotum with the median sulcus wider than in *plagifera* Lec., the sides of the pronotum converging from base to apex, nearly straight, feebly angulate before the middle, the disk very finely punctate; elytral apices wider and less strongly dehiscent than *plagifera*; pygidium in female only feebly convex, coarsely punctured; male with pronotum longer than *plagifera*, sides nearly straight, pubescence short, last ventral segment of abdomen with lateral spines very strongly developed.

The type series contains three black specimens; type ♂, Oregon; ♂, Nevada; ♀, Oregon.

The type of *subcostata* Fall was compared with the type of *anthracina* Lec. by Mr. H. C. Fall and the senior author. The two types are exceedingly close and it was decided to leave them in this paper under *anthracina* Lec. Of the *subcostata* series, Mr. Hopping has collected more than a dozen specimens in Tulare and Kern counties, California, in all but one of which only the apical portions of elytra were black, the basal part of the elytra and the pronotum being red. One specimen has only the base of the elytra and the disk of the head and pronotum red; another, sent for examination by Mr. Schaeffer, was entirely black, as are three specimens from Onion Valley, California, in the United States National Museum collection.

at Washington and the type series. The pronotum has the apical and basal constrictions strongly impressed only on the dorsum, and the elytra have two more or less strongly marked costæ.

This species is larger than any other North American species of the genus known to us, excepting *emarginata* Fab. and *gigas* Lec. and individuals of *obliterata* Hald.

Eleven specimens were before us from Sierra Nevada mountains in central California and one from Oregon.

Type locality, *anthracina* Lec.: Oregon.

Type locality, *subcostata* Fall: lake Tahoe, California.

- (4) *Leptura abdominalis* Hald., 1847, Trans. Am. Phil. Soc., (2), vol. 10, p. 63.

atrovittata Bland., 1864, Proc. Ent. Soc., p. 255, (♀).

Length 14 mm. The shape is peculiarly convex longitudinally and cuneiform. The male is black, except the abdomen, which is red, and the six distal joints of the antennæ, which are annulated. The female is testaceous with the antennæ annulated as in the male; the pronotum with two large black spots or entire central area black; elytra with wide, entire, lateral vittæ, and sutural black vittæ narrowing from the base to a point just beyond the middle, the diskal red band extending from the humeri obliquely to the suture behind the middle and thence to the sutural angle of the apex; the lateral margin red; the legs bicoloured, black on the apical portion of the femora and tibiæ.

Five specimens have been before us, one from Georgia and one from New Jersey, sent for examination by Mr. Chas. Liebeck, and three from Alabama. Several others have been seen in collections. In the Leconte collection are one black male and two bicoloured females. This is an exceedingly rare species, represented in very few collections. Mr. J. N. Knull has reared it from *Taxodium*.

Habitat: Atlantic States, Michigan, New Jersey to Georgia, Alabama, and Mississippi. Other localities given in literature, Louisiana and Texas.

Host plants: *Juniperus* (Felt), *Taxodium distichum* (Knull).

Type locality: none given.

- (5) *Leptura kerniana* Fall, 1907, Trans. Am. Ent. Soc., vol. XXXIII, p. 249. Length 11 mm. The original description is quoted here in full. Only the type is known.

"*Leptura kerniana* Fall. Form of *propinqua* and allies, black, elytra and abdomen dull rufous, legs rufous, tarsi and tips of the tibiæ blackish; pubescence short, greyish on the prothorax and beneath, blackish on the elytra. Head obsoletely sparsely, finely punctate, median line impressed; antennæ entirely black, a little more than three-fourths the length of the body (♂), the joints proportioned as in *propinqua*. Prothorax as wide as long, exclusive of the posterior angles, which are strongly acutely produced; sides sinuately convergent from the base to a somewhat tuberculiform prominence in front of the middle, thence straight and rapidly convergent to apex; apical constriction and posterior depression well marked, median line concave; disk rather finely but not closely punctate. Elytra strongly narrowed behind, finely sparsely punctate and immaculate, apices obliquely truncate, the outer angle acute but not spiniform. Length 11 mm. Described from a single male specimen taken by Mr. F. S. Daggett on the Kern river (elevation 6,000 feet), California.

The fifth ventral is broadly but not deeply arcuately emarginate, the limiting angles acute. In *propinqua* the fifth ventral is much more deeply emarginate. The unspotted elytra and coloration easily distinguish the present species from any of those nearly related."

Type locality: Kern river, California.

- (6) *Leptura plagifera* Lec., 1874, Smith. Misc. Coll., vol. XI, 224.

Length 10 to 13 mm. This species is probably found only in the high mountains of the west. The disk of the elytra is generally black with a reddish testaceous margin; specimens with the elytra entirely black or entirely red are, however, not uncommon. The elytra are usually distinctly costate. The abdominal segments are red in all our specimens.

Fifty-two specimens examined from British Columbia and California south to San Bernardino, mostly from British Columbia. Other localities given in literature: Colorado, Nevada, Oregon, Idaho, Montana.

Host plant: *Pinus ponderosa* (Craighead, Hopping).

Type locality: lake Tahoe, California.

- (7) *Leptura subhamata* Rand., 1838, Bost. Jour. Nat. Hist., vol. 2, p. 44.
armata Hald., 1853, Trans. Am. Phil. Soc., vol. X, p. 63.
interrupta Newm., 1841, Entomologist, London, p. 72.
lecontei Dej., 1837, Dej. Cat., 3 ed., p. 381.
elegans Hald., 1853, Trans. Am. Phil. Soc., p. 63.

Length 10 to 14 mm. The form *elegans* Hald. is the female and has a bicoloured pronotum; in the males that we have seen the pronotum was always black. Mr. Morris, of Peterborough, Ontario, has taken the two forms *in coitu*. The extent of black maculation on the elytra varies greatly in both sexes, some females having only a median triangular black spot and a very narrow black line on the sutural and lateral margins.

Fifty-three specimens were examined from Pennsylvania, New York, Ontario, Quebec, and Nova Scotia. Other localities given in literature are, "N.J.", "N.H.", "Mich.", "Va.", "Ill.", "Mass.", "N.C.", "Ind."

Host plants: *Tsuga* (Felt), *Pinus* (Craighead).

Type locality: Maine.

- (8) *Leptura plebeja* Rand., 1838, Boston Jour. Nat. Hist., vol. 2, p. 28.

Length 9 to 10 mm. Specimens are known with the elytra entirely black, or testaceous with black apices. The abdominal segments are usually red.

Nineteen specimens have been examined from Massachusetts and Ontario. Other localities given in literature, "E. St." (Eastern States), Michigan, L. Superior.

- (9) *Leptura propinqua* Bland., 1865, Proc. Ent. Soc. Phila., vol. 4, p. 384.
regularis Csy., 1913, Mem. on the Coleop., p. 259.
minuscula Csy., 1913, Mem. on the Coleop., p. 260.

Length 8 to 14 mm. The antennæ, legs, and prothorax are entirely black in this species and the hind legs very slender and somewhat longer than normal; hind legs 16 mm., body 13 mm. The testaceous elytra are regularly ornamented with a median, transverse, lateral spot, a post humeral spot, and the elytral tips black; a slender species, with slender antennæ and legs. This is probably a distinct species, but many specimens can be distinguished from the form of *obliterata* Hald. known as *soror* Lec. only by colour and the somewhat more slender antennæ and legs. Mr. Hopping has taken numerous pairs of each of these species and on no occasion was intermating observed.

L. minuscula Csy. is represented in the type series by five males and one female, all small, with the pronotum rather more coarsely and sparsely

punctured than usual; but probably not distinct. The type of *regularis* Csy. is a female, probably of *propinqua* Bland., with the pronotum slightly wider and the elytra rather more sparsely punctured than usual.

One hundred and thirteen specimens were examined from Colorado, New Mexico, Utah, Kansas, California, Washington, Oregon, and British Columbia. Other localities given in literature are Nevada, Arizona, and Idaho. It is a Sierra Nevada and Rocky Mountain species.

Host plant: *Picea engelmanni* (Craighead).

Type locality: Colorado territory; collected by James Ridings, in 1865.

- (10) *Leptura obliterata* Hald., 1847, Trans. Am. Phil. Soc., (2), vol. 10, p. 62.
soror Lec., 1873, Smith. Misc. Coll., No. 264, p. 223.
perductor Walk., 1866, Nat. Hist. Vanc., vol. 2, p. 333.
vitiosa Lec., 1854, Proc. Acad. Phila., vol. VIII, p. 18.
idahoensis Csy., 1913, Mem. on the Coleop., p. 259 (♂).

Length 11 to 18 mm. The body in the *female* is black with the first and last segments of the abdomen variably reddish; the head black; the pronotum black with the sides testaceous or reddish; the elytra testaceous or reddish, with a postbasal spot of varying size, a posthumeral lateral spot, a median transverse band and a post apical band, black; the apices reddish, rarely almost entirely black. The *male* is notably more slender, with the postbasal spot on the elytra frequently evanescent, and the apices in many cases black. The legs are usually yellow or bicoloured, and the antennæ annulated in the females and in many cases entirely black in the males.

The colour phase *soror* Lec. usually has the postbasal black spots evanescent or absent, the median black bands in some cases reduced to spots, and the apices usually entirely black.

After examining a very long series we find ourselves unable to separate *obliterata* Hald. from *soror* Lec. by any satisfactory characters. The maculation varies greatly; the colour bands of the elytra in many cases become spots; the usually reddish elytral tips of the *obliterata* type are in some cases black; the males of the *soror* type in some cases have red elytral tips; and males with the discoidal black marking absent (*soror* type) have been taken paired with the typical female *obliterata*. It is impossible to distinguish one from the other in a long series. It is true that the *soror* type of Sierra Nevada mountains seems to be constant in that region, but both the *soror* and *obliterata* types are quite common in British Columbia. The type of *vitiosa* Lec. is a large female, with the elytra yellow, median spots faint, apex black.

One constant colour character exists in all our specimens, in that the sides of the prothorax are testaceous.

Two hundred and sixty-four specimens have been examined from California, Oregon, Washington, British Columbia, and Idaho. Other localities cited in literature are Nevada and Montana.

Host plants: *Abies*, *Picea*, *Tsuga*, *Pseudotsuga* (Craighead), *Pinus ponderosa* (Hopping) for *obliterata*; *Pinus murrayana* (Craighead) for *soror*.

The type locality of *soror* Lec. was California, described in 1873; that of *obliterata* Hald., Oregon, described in 1847.

- (11) *Leptura deleta* Lec., 1850, Jour. Acad. Nat. Sci. Phila., (2), vol. 1, p. 328.

Length 14 mm. We are indebted to Mr. C. A. Frost for a female, collected at Sherburn, Mass., compared with the type of *deleta* Lec. The pronotum has the disk black, with the sides rufous and clothed with short, recumbent pubescence and in many cases with long, flying hairs, the median line rather narrowly impressed, sulcate and shining at the bottom; the elytra rufous, with the posthumeral, lateral, black spot very small and faint, a lateral, median, black spot of moderate size, well defined, and the apices dark and reddish at the tip; the abdomen red, except the lateral angles of the 1st segment, which are black.

L. deleta Lec. is left for the present as a separate species, although it is difficult to separate our examples from the *soror* form of *obliterata* Hald., and it appears possible that, when a large number of examples of *deleta* are available, every gradation between *deleta* and *obliterata* will be found.

Eight specimens examined, three of which are in the type series in the Leconte collection, and four in the Blanchard collection, three males and one female larger, with the elytra stouter, and the tips faintly marked. Eastern States.

Type locality: Massachusetts.

- (12) *Leptura lineola* Say, 1824, Jour. Acad. Nat. Sci., vol. 3, p. 421.
indirecta Newm., 1841, Ent., p. 71.
cincta Hald., 1853, Trans. Am. Phil. Soc., vol. 10, p. 63.
var. obsoleta Hald., 1853, *ibid.*
var. lateralis Hald., 1853, *ibid.*

Length 8 to 11 mm. The elytra of this species are testaceous with black, longitudinal vittæ. The vittæ are in some cases interrupted on the sides, causing rather curious effects in maculation which gave rise to Haldermann's varieties. The very slender form of *lineola* Say is aberrant among the North American species of the genus, approaching more closely some European species.

Seventy-five specimens have been examined from Pennsylvania, New York, Massachusetts, and Ontario. In literature are cited the localities "Va.", "Tex.", "Md.", "N.H.", "N.C.", and "Ind."

Host plant: *Betula* (Craighead).

Type locality: Pennsylvania.

TYPOCERUS Leconte

1850, Jour. Acad. Nat. Sci., vol. 1 (2nd ser.), p. 333.

This group has been considered a subgenus of *Strangalia* Serv. by European writers; but the striking characters of the antennæ and wings seem to us to merit generic distinction.

Prosternum convex; pronotum trapezoidal with hind angles produced over the humeri; distal segments of the antennæ with distinct poriferous areas; moderately stout species, with the elytra cuneiform; middle tarsi with 1st segment hardly longer than 2nd and 3rd united; forecoxal cavities narrowly open behind; wing with closed cell in the radial sector stout and triangular. Genotype, (*Leptura*) *velutina* Oliv.

KEY TO THE SPECIES

- A Antennæ black (except sometimes annulate in *balteatus*), with segments 6 to 11 bearing impressed poriferous areas.
- B Pronotum clothed with abundant, long, erect hairs, with or without recumbent golden pubescence; elytral apices obliquely truncate-acuminate.
- C Pronotum densely clothed with recumbent golden pubescence beneath long, erect hairs; punctation of pronotal disk dense with fine and coarse punctures intermixed; elytral apices very strongly acuminate.
(1) *acuticauda* Csy.
- CC Pronotum with recumbent golden pubescence only at apical and basal margins; punctation uniformly coarse and deep.
- D Pronotum only moderately widened behind, inflated before the middle, disk rather closely punctured, with recumbent yellow pubescence dense at base, apex, and on the sides beneath; elytra moderately cuneiform, feebly shining, closely punctured, with apices obliquely truncate.
(2) *zebratus* Oliv.
- DD Pronotum very strongly regularly widened from apex to base, moderately constricted at the apex, not inflated in front, disk very coarsely sparsely punctured, with recumbent yellow pubescence dense at base and apex only; elytra very strongly cuneiform, shining, punctures small and rather widely separated, apices very strongly oblique, acuminate, slightly emarginate.
(3) *badius* Newm.
- BB Pronotal disk clothed with recumbent or semi-recumbent pubescence, without long erect hairs intermixed.
- C Vestiture of pronotum dark or nearly black, with or without apical and basal margins of golden pubescence.
- D Pubescence of pronotum and elytra piceous to black, without golden margins on the former; punctation of pronotum fine and moderately close, that of elytra fine and dense.
(4) *lugubris* Say.
- DD Pronotum margined with golden pubescence at apex and base, coarsely punctured.
- E Pronotum rather closely punctured; elytra with small punctures, black with two large, basal, reddish-yellow patches on each, in many cases more or less completely fused, humeri black or with a small pleural spot, apical half black, rarely with a small postmedian and an apical spot; legs black; apex of female pygidium feebly, broadly emarginate.
(5) *lunatus* Fab.
- EE Pronotum sparsely punctured; elytra with coarse punctures towards the base, black with four, narrow, transverse, yellow bands, the basal of these incomplete, 2nd and 3rd in many cases more or less completely fused at the suture; legs rufous or bicoloured; apex of female pygidium narrowly, deeply emarginate.
(6) *sparsus* Lec.
- CC Vestiture of pronotum golden throughout, with denser band at basal and apical margins.
- D Pronotum with sides subparallel on basal three-fourths, abruptly narrowed in front, disk with moderate to coarse dilated punctures; elytra with apices obliquely truncate.
- E Pronotum not inflated in front, disk densely, coarsely, rugosely punctate, pubescence stout and recumbent, conspicuous; antennæ slender; elytra yellow with three narrow, black, transverse bands, apices in some cases black; punctation very shallow, apices strongly truncate, outer angle acute.
(7) *balteatus* Horn.
- EE Pronotum inflated in front, disk moderately not very closely punctate, interstices distinct, pubescence fine and erect; antennæ notably stout; elytra black with four transverse yellow bands; punctation rather deep, apices feebly truncate, outer angle rounded.
(8) *brunnicornis* Lec.
- DD Pronotum very much widened behind, disk with small, subgranulate punctures; elytra with apices emarginate.
- E Elytra reddish brown or black, with transverse yellow bands and the pubescence of the dark areas nearly black, very finely and closely punctured; pronotum with sides regularly converging, hardly inflated in front.

- F Elytra reddish-brown with narrow, transverse, yellow bands, punctation small and close in front, finer and denser towards the apex. (9) *velutinus* Oliv.
- FF Elytra black, reddish behind, with wide, transverse, yellow bands, punctation small and close throughout, not quite so close as in *velutinus*, with the surface more distinctly shining. (10) *trimaculatus* C. and K.
- EE Elytra black with transverse, yellow bands and the pubescence of the dark areas mostly golden, punctation moderate in size and density, pronotum distinctly inflated in front. (11) *manitobensis* n. sp.
- AA Antennæ brown or rarely with the distal segments black, with segments 7 to 11 with impressed poriferous areas.
- B Front of head elongate, length from transverse impression to clypeal suture distinctly more than half the width at the impression; pronotal punctures small; antennæ at most only moderately stout (♀), with poriferous areas rather wide and of moderate size.
- C Fifth ventral of male very widely, deeply excavated; fifth ventral of female with a broad, feeble median sulcus which is interrupted before the apex by a transverse carina; antennæ moderately stout; elytra usually with dark colour predominating. (12) *confluens* Csy.
- CC Fifth ventral of male emarginate and only very feebly excavated at apex; fifth ventral of female with a broad, shallow median sulcus extending to the apex, without a transverse, subapical carina; antennæ slender; elytra with pale colour predominating along the suture. (13) *sinuatus* Newm.
- BB Front of head very short, length from transverse impression to clypeal suture distinctly less than half the width at the impression; pronotum with punctures coarse and dilated, smaller at base and apex; antennæ very stout, with poriferous areas very narrow. (14) *gloriosa* Hop.

- (1) *Typocerus acuticauda* Csy., 1913, Mem. on the Coleop., p. 274.
thoracicus Csy., 1913, Mem. on the Coleop., p. 274.

Length 10 to 12 mm. The apices of the elytra are strongly obliquely produced, acuminate; the type has the elytra ferruginous, without spots; several of the type series have the spots very faint. Our series varies considerably in colour markings, some having the elytra almost uniformly reddish or testaceous. The maculate specimens of this species have a superficial resemblance to *velutinus* Oliv.

T. thoracicus Csy., a single specimen, without place label, differs from *acuticauda* only in the somewhat paler colour and in the pronotum being more strongly widened in front. When more examples are available this may prove to be a distinct species.

Eleven specimens were studied from Massachusetts, Connecticut, Nova Scotia, Ontario, Virginia, Alabama, Florida, and Georgia, in addition to the type series of eleven specimens in the Casey collection. In literature, Pennsylvania and New Jersey are cited.

Type locality: "Mass."

- (2) *Typocerus zebratus* Oliv., 1795, Ent., vol. IV, p. 18.
Leptura aurigera Newm., 1841, Ent., p. 70.
Strangalia zebrata Fab., 1801, Syst. El., vol. 2, p. 364.
Strangalia carolina Weber, 1801, Observ. Ent., p. 91.

Length 10 to 14 mm. A black species, the venter densely clothed with pale pubescence; the pronotum bordered with golden pubescence in front and behind; the elytra with four transverse, reddish-yellow bands, 1st basal, interrupted at the humeri, 2nd antemedian, 3rd postmedian, 4th anteapical.

Fourteen specimens are before us from Florida, Georgia, Virginia, New Jersey, Texas, and Alabama. Mr. Leng cites New York to Florida.

Host plants: dead stumps of the genus *Pinus*.

(3) *Typocerus badius* Newm., 1841, Ent., p. 69.

Length 15 mm. The female in the Canadian National collection is black, shining, with four, narrow, transverse, reddish-yellow bands on the elytra; antennæ short, reaching little beyond the middle of the elytra, tempora very short and strongly constricted; the pronotum trapezoidal, as wide as the humeri at the base, the sides nearly straight, gradually narrowed, and suddenly constricted at the anterior margin, about as long as the width; with a transverse band of dense, yellow pubescence in front and behind, the disk convex, sparsely clothed with long, erect, black hairs, coarsely, sparsely punctate and shining; elytra cuneiform, finely punctured, somewhat more sparsely towards the base, shining, with four, reddish-yellow, transverse bands; the basal band reduced to a scutellar spot, the ante-median band narrow, arcuate, from the side margin almost to the suture; the postmedian band strongly widened toward the suture; the anteapical band reduced to a spot near the suture; the apices feebly dehiscent, and very strongly obliquely truncate, feebly emarginate, appearing decidedly acuminate; the femora, tibiæ, and apex of the abdomen red; forecoxal cavities nearly closed behind; proepisternal pits large and numerous. The Leconte specimen has the colour of the elytra chocolate brown with the spots indistinct. A male in the collection of Mr. Liebeck has the elytra a uniform reddish brown, with pronotum slightly inflated in front and antennæ nearly the length of the body.

This beautiful species is apparently very rarely found in collections. We have seen only the specimen in the Leconte collection, obtained from the British Museum, one specimen in the collection of Mr. J. N. Knull, one from Mr. Liebeck's collection, one in the U.S. National Museum, and one in the Canadian National collection described above.

Distribution: Florida.

Type locality: St. John's bluff, Florida.

(4) *Typocerus lugubris* Say, 1823, Jour. Acad. Phila., vol. 3, p. 419.

Length 8 to 10 mm. The specimens we have seen are not margined with paler pubescence on the prothorax, either apically or basally.

Four specimens are before us from southern Illinois, Kansas, and Ontario.

Host plant: Pine stumps (Craighead).

Type locality: "Lower Missouri."

(5) *Typocerus lunata* Fab.,¹ 1801, Syst. El., vol. 2, p. 364.

arcuata Oliv., 1795, Ent., vol. 4, p. 73.

(?) *lunulatus* Swed.,¹ 1787, Nov. Act. Stockh., 8, 3, n. 3, 18.

Length 9 to 11 mm. A southern species, easily recognized by the characters given in the key.

Thirty-nine specimens were examined from Alabama and Texas. One is labelled "Alameda co., Calif.," probably by mistake. Other localities in literature: North Carolina, Georgia, and Florida; Pennsylvania to Georgia (Leconte).

¹ Aurivillius, 1912, Coleopt. Cat., p. 243.

Host plants: decaying stumps of the genus *Pinus*.

Type locality: Carolina.

Type locality: *lunulatus* Swed., "Cape of Good Hope."

In recent catalogues *lunata* Fab. has been placed as a synonym of *lunulatus* Swed.; but, since we have been unable to find a satisfactory explanation for this interpretation in the literature, we are retaining the name *lunata* Fab.

- (6) *Typocerus sparsus* Lec., 1878, Proc. Am. Phil. Soc., vol. XVII, p. 614.

Length 6 to 8 mm. This species is easily recognized by the characters given in the key.

Twenty-seven specimens are before us from Ontario, Quebec, and Manitoba. Other localities in literature: Michigan, lake Superior, Wisconsin, and Ohio.

Type locality: Escanaba, lake Superior.

- (7) *Typocerus balteatus* Horn, 1878, Trans. Am. Ent. Soc., vol. VII, p. 55.

Length 9 to 10 mm. This species is distinguished by the yellow elytra marked with narrow, transverse, black bands, and the characters given in the key. The abdomen is in some cases reddish; the legs are reddish or partly blackened.

Six specimens have been examined from "North West Territories," Alberta, and Utah. Other localities in literature: Colorado, Montana, and Arizona.

Type locality: "Occurs in Colorado (Morrison) and Arizona (Fuller)."

- (8) *Typocerus brunnicornis* Lec., 1873, Smith. Misc. Coll., No. 264, p. 214.

Length 10 to 13 mm. A more slender species than *balteatus* Horn, black with indistinct pale pubescence, the antennæ, abdomen, and tarsi in some cases ferruginous. The single male before us has the antennæ notably stout, strongly serrate, with large poriferous areas on segments 6 to 11; the pronotum with sides on basal two-thirds nearly parallel, sub-inflated in front and strongly narrowed to the apex; the disk strongly inflated, moderately, not densely, punctate, the interstices shining, pubescence pale, denser at anterior and basal margins; elytra strongly cuneate, punctures deep, moderate in size and density; black with four, transverse, yellow bands, wider towards the suture which they do not quite attain; 1st, basal, widest towards the scutellum, interrupted at the humeri; 2nd, postbasal, of moderate width; 3rd, postmedian, much narrower except towards suture; 4th, anteapical, reduced to a spot near the suture; the apices feebly truncate with the outer angles strongly rounded; last two dorsal segments shining, feebly punctured and indistinctly pubescent, last segment impressed at the apex; last ventral segment broadly, feebly impressed at the apex.

One specimen before us from El Paso county, Colo., agrees most closely with the third specimen in the Leconte collection, from Utah. Only this, the type series, and three under *sinuatus* in the Leconte collection have been studied by the writers. The type has the antennæ, legs, and margins of the elytra reddish, and the antennæ slightly stouter.

Distribution in literature: Colorado, Texas, New Mexico, and Florida.

Type locality: Texas.

(9) *Typocerus velutinus* Oliv. 1795, Ent., vol. 4, p. 32.

(*Leptura*) *fugax* Fab., 1798, Syst. Ent. Suppl., p. 153.

(*Leptura*) *tenuior* Kby., 1837, Fauna. Bor. Am., pt. 4, p. 181.

(*Leptura*) *movilis* Newm., 1841, Ent., p. 6.

Length 8 to 11 mm. This common species is easily recognized by the characters given in the key.

Fifty-five specimens have been examined from New York, Rhode Island, Quebec, Ontario, Manitoba, and Nova Scotia. Other localities in literature: Maine, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Virginia, Georgia, Florida, Louisiana, Wisconsin, Indiana, "Indian Ter.," and Ohio. The southern records may refer to *trimaculatus* C. and K.

Host plants: decaying hardwoods and conifers (Craighead).

Type locality: "Amerique septentrionale."

(10) *Typocerus trimaculatus* C. and K., 1922, Ent. News, vol. XXXIII, p. 304.

Length 15 mm. This species is closely allied to *velutinus* Oliv. and *manitobensis*, but is distinguished by the characters already given. We have seen the type, several specimens in the collection of the U.S. National Museum, and six specimens in the Leconte collection under *velutinus*. The colour of the elytra appears to be distinctive and the elytra are more distinctly shining owing to the definitely sparser punctation. The punctures are a little coarser than in *velutinus* and evenly distributed, not noticeably denser towards the apices. The proepisternal pits are also more numerous on the single specimen before us.

Distribution: Florida, Georgia, Louisiana, and Texas.

Type locality: New Roads, La.

(11) *Typocerus manitobensis* n. sp.

Length 10 mm. Shape similar to *velutinus* Oliv.; black with the legs red, tarsi blackish, the apical margin of first three ventral segments, apical half of fourth and all the fifth, red; the elytra black, with four, transverse, yellow bands.

The head is short and abrupt behind the eyes; antennæ black, outer segments very feebly serrate; with very small poriferous spaces on segments 6 to 11.

The pronotum is shorter than the width at the base; with a strong anterior and basal transverse impression; sides subangulate before the middle, broadly concave on the caudal half, laminate and produced over the humeri behind; disk inflated, shining, punctation moderate, not close, feebly granulate; the pubescence golden, semirecumbent, somewhat denser in front and behind.

The elytra are distinctly wider than the pronotum, widest behind the base, strongly narrowed at apex; humeri longitudinally inflated and reddish; apices feebly dehiscent, somewhat obliquely truncate-emarginate, the outer angles more strongly produced; the punctation coarse, dilated, but little smaller behind, not very close at the base; the surface feebly rugulose, but not granulate; the basal margin mesad of the humeri, the scutellum, and the entire suture, black; the basal, yellow, transverse band covering the humeri and uniting with the second, antemedian, yellow band

on the sides and towards the suture, so that an irregular, transverse black spot is enclosed; the median black band entire from suture to side margin; the third, postmedian, yellow band entire; the apical, fourth band black with a faint trace of an anteapical yellow band. The pygidium is distinctly emarginate.

Holotype—♀, Victoria Beach, Manitoba; 13-viii-22; G.S.B. No. 1384 in the Canadian National collection, Ottawa. Received through the kindness of Mr. J. B. Wallis.

- (12) *Typocerus confluens* Csy., 1913, Mem. on the Coleop., p. 272.
caligans Csy., 1913, Mem. on the Coleop., p. 273.

Length 9 to 13 mm. In our series of *confluens*, compared with the type series of six specimens, all gradations in colour of the elytra are represented from maculate to almost entirely black. This species is evidently the series spoken of by Leconte¹ under *T. sinuatus* as, "b, c, and d," ♂.

The typical colour pattern of the elytra is black or brown, with four, transverse, yellow bands, variably broken into spots, the two median bands in some cases united at the suture.

One hundred and forty-six specimens are before us from Kansas, Colorado, and South Dakota.

Type locality: "Kansas and Colorado."

- (13) *Typocerus sinuatus* Newm., 1841, Ent., p. 70.
octonotata Hald., 1847, Trans. Am. Phil. Soc. (2), p. 62.
arapahoe Csy., 1924, Mem. on the Coleop., vol. XI, p. 278.

Length 10 to 12 mm. The colour pattern of the elytra was perhaps originally black with four, transverse, yellow bands; but the latter have become enlarged and fused along the suture, until in the majority of our specimens the elytra are yellow or reddish-yellow with a longitudinal row of four, lateral, black spots, the last apical, more or less united; in a few individuals, the last two pairs are variably fused across the suture.

T. arapahoe Csy. is represented in the type series by three large specimens similar to *sinuatus*; but with the first black spots continuous across the dorsum to the suture, not united except at the extreme margin in one specimen. It is evidently *sinuatus* with the black spots more strongly developed laterally. Intergradations are suggested in our series.

Two hundred and sixty-five specimens are before us from Montana, Illinois, Dakota, and Kansas, including eight pairs. Other localities in literature: Florida, Virginia, Indiana, Indian Ter., Texas, Colorado, Missouri, Nebraska, Louisiana, Maryland, Pennsylvania, Massachusetts.

Type locality: St. John's bluff, Florida.

- (14) *Typocerus gloriosa* Hop., 1922, Can. Ent., July, p. 166.

Length 13 mm. The type of this very distinct species is a female; through an error in transcribing from the manuscript it was described as a male.

The species is readily distinguished by the characters given in the key; the short front and very stout antennæ are particularly striking, and the colours are unusually vivid for the genus. The body, legs, and antennæ red, the elytra with alternate yellow and dark bands; 1st, basal, yellow,

¹Smith. Misc. Coll., vol. XI, 1874, p. 215.

diskal; 2nd, reddish-brown, covering the humeri; 3rd, yellow, very wide, fused at the suture and on the sides with the 5th, which is wide, the two enclosing the 4th, which is reduced to a transverse black spot on each elytron; the 6th, black, wide, with cephalic and caudal margins concave; the 7th, a large, yellow spot; the apices dark red to black.

In addition to the type in the Canadian National collection, one male has been examined in the collection of the Brooklyn Museum, from Washington county, Utah.

This male is paler than the type; the head, antennæ, legs, and pronotum pale red; the elytra yellow with transverse markings, humeri reddish, median spot, postmedian band, and apex piceous; antennæ with segments 5 to 10 distinctly serrate and notably stout, the impressed areas on segments 6 to 11 very narrow; length 14 mm., width at base of elytra 4.5 mm.

Type locality: Fort Wingate, N.M.

CHARISALIA Csy.

1913, Mem. on the Coleop., vol. IV, p. 247.

Prosternum convex; pronotum very stout, wider than long, trapezoidal, not constricted behind, with hind angles acute, conical, and prominent, fitting over the humeri; elytra wide, parallel or somewhat inflated behind; antennæ normal, without poriferous impressed areas; eyes small, tempora strongly inflated; first segment of hind tarsi not pubescent beneath; allied to *Euryptera*. Genotype, (*Leptura*) *americana* Hald.

Charisalia americana Hald., 1853, Trans. Am. Phil. Soc., vol. X, p. 63.

Original description:

"246. *S. americana*. Black, head and prothorax rufous, with fulvous hair; elytra parallel, slightly obliquely truncate.

$4\frac{1}{2}$ ''' long; $1\frac{1}{4}$ ''' wide. Pennsylvania. *Leptura americana*, Mels. Cat., No. 836, *Stenura fulvicollis*. Dej. Cat.

Head rufous, eyes, antennæ, and maxillary palpi black, the last with the articulations tipped with yellowish; a transverse, impressed line above the clypeus, and another behind the antennæ, the impressed frontal line uniting them; prothorax swelled above, very wide posteriorly, a large, transverse depression each side of the middle, on the posterior margin; elytra thickly covered with piliferous punctures; venter with a fulvous tinge, and clothed with fulvous hair."

This very distinct species is apparently rare in collections and the name is in many cases applied to *capitata* Newm. The length is approximately 11 mm.; black with the head and pronotum red, eyes small, tempora inflated; pronotum trapezoidal, wider than long, sides strongly arcuately constricted in front, hind angles *conical* and *protuberant*, the disk convex and feebly punctured; the elytra slightly wider than the pronotum, the sides parallel or somewhat wider behind, the punctation close, deep, and moderate in size, the pubescence very fine but distinct; broadly rounded or subtruncate and slightly dehiscent at the apex.

Two specimens have been before us and others have been studied in the Leconte, Casey, Knull, Wenzel, and U.S. National collections. In the Leconte collection there are three specimens, one male and two females, from "Ill.," "Gulf States," and "Central Valley." In the Casey collection there are four examples, one male from Illinois, and three females, one

each from Louisiana, Kentucky, and Michigan. In the U.S. National collection the localities represented are: Louisiana, Michigan, Kentucky, and Iowa, and in the Knull collection, Kansas and Ohio.

Type locality: Pennsylvania.

ANOPLODERA Mulsant

1840. Col. Fr. Long., p. 285.

Trigonarthris Hald. 1847, Trans. Am. Phil. Soc., (2), vol. X, p. 65.

Judolia Mulsant, 1863, Col. Fr. Long., ed. 2, p. 496.

Nivellia Mulsant, 1863, Col. Fr. Long., ed. 2, p. 564.

Corymbia Des Gzisz, 1886, Recherche de l'espece Typique de quelques anciens genres.

Ortholeptura Casey, 1913, Mem. on the Coleop., vol. IV, p. 204.

Brachyleptura Casey, 1913, Mem. on the Coleop., p. 251.

Strangalepta Casey, 1913, Mem. on the Coleop., p. 257.

Xestoleptura Casey, 1913, Mem. on the Coleop., p. 264.

Strophiona Casey, 1913, Mem. on the Coleop., p. 264.

Metepisternum broad in most species; pronotum campanulate to quadrate, the basal angles acute, laminate, or obtuse, but not prolonged over the humeri; prosternum convex; forecoxal cavities usually narrowly open or closed behind. Genotype, (*Leptura*) *sexguttata* Fab.

KEY TO THE SPECIES

- A Pronotum with basal angles acute or subacute (*impura*) and laminate.
- B Pronotum feebly and gradually narrowed before the middle (*carbonata*, ♀, rather strongly narrowed), basal transverse impression narrow, sparsely punctured, and shining towards the middle and continuous across the dorsum; first two segments of hind tarsi with stiff setal brush; rather elongate species.
- C Disk of pronotum flattened, centre of disk with punctation nearly obsolete, smooth and shining; elytral apices truncate, feebly, narrowly emarginate. (1) *carbonata* Lec.
- CC Disk of pronotum convex, roughly deeply punctured, closely in front on the median line, which is smooth and subcarinate behind; elytral apices broadly emarginate.
- D Pronotum not abruptly constricted at the apical margin, with the punctures smaller and closer on the median line in front, but coarser and much less closely placed on the sides of the disk; basal transverse impression gradually impressed; elytra with punctures coarse and subconfluent on the basal half, small and close behind; antennæ in the female very short, stout, and clavate. (2) *brevicornis* Lec.
- DD Pronotum abruptly constricted at the apical margin, with the punctures small and dense throughout, in some cases a little sparser midway between the sides and the middle line; basal transverse impression strongly, abruptly impressed; elytra with the punctures small and close on basal half, minute and dense behind.
- (3) *nigrella* Lec.
- BB Pronotum with sides inflated towards middle, then very strongly and abruptly narrowed to the apical margin, which is very much shorter than the basal margin, basal transverse impression broad, densely punctured, and opaque; short, stout species.
- C Pronotum with the sides inflated and angulate before the middle; the basal transverse impression continuous across the dorsum (except *knulli*).
- D Elytra rounded or subtruncate at the tip.
- E Head at least nearly as wide as pronotum at the middle; the pronotum with anterior impression deep and wide.

- F Elytra testaceous, with a dark lateral blotch near the middle, apices variably cloudy; pronotum and elytra finely, very densely punctured, pubescence distinct and golden; 1st segment of hind tarsi with a pubescent sole. (4) *matthewsii* Lec.
- FF Elytra black, pronotum and elytra coarsely, closely, confluent punctured, pubescence very short, indistinct, entire body black; 1st segment of hind tarsi with a stiff setal brush. (5) *grossa* Lec.
- EE The head distinctly narrower than the pronotum at the middle; pronotum with anterior impression feeble. (6) *Judolia* Muls.)
- F Pronotum with basal transverse impression moderately deep; scutellum rounded, not emarginate at apex; form very stout; elytra distinctly narrowed behind.
- G Elytral apices very broadly rounded.
- H Pronotum with the transverse basal impression continuous, though feeble across the median line; elytra subopaque, closely finely punctate. (6) *quadrata* Lec.
- HH Pronotum with the basal transverse impression not continuous across the median line; elytra shining, rather sparsely moderately punctate. (7) *knulli* n. sp.
- GG Elytral apices narrowly rounded.
- H Pronotum usually as long as wide, the pubescence long and distinct. (8) *instabilis* Hald.
- HH Pronotum distinctly wider than long, the pubescence short and stout; the disk in some cases impressed on the sides. (9) *flaviventris* Schaeffer.
- FF Pronotum with basal transverse impression feeble; elytra with scutellar and humeral lobes equally prominent; scutellum emarginate at apex; the form more elongate; the sides of the elytra nearly parallel. (10) *sexmaculata* Linn.
- DD Elytra distinctly truncate at tip, with apices acute on the sutural and external angles, the margination obsolete on the truncate apex; post basal black bands not arcuate on the cephalic margin. (*Stenostrophia* Csy.).
- E Vestiture of body in general bright yellow and rather long.
- F Vestiture of black areas on pronotum and elytra brown or black; pronotum distinctly granulate-punctate, the punctures of median size, deep, granulate and usually very closely placed. (11) *tribalteata* Lec.
- FF Vestiture of entire dorsal surface yellow; disk of pronotum smooth, punctures small and not closely placed. (12) *coquilletti* Linell.
- EE Vestiture of the body dark or pale brown and rather short. (13) *amabilis* Lec.
- CC Pronotum with the sides rounded or sinuate at the middle, not angulate; the transverse basal impression not continuous across the dorsum, interrupted by an extension of the disk at the middle.
- D Elytra nearly twice as wide as pronotum at the base; basal transverse impression of pronotum feebly evident on the sides at the base; colour black; pubescence sparse and distinct; pronotal punctures dense and moderate in size; elytral punctures a little smaller and sparser than on the pronotum; scutellum emarginate at apex. (14) *barbari* Fall.
- DD Elytra but little wider than pronotum at the base; pronotum with transverse basal impression deep towards the sides.
- E Elytra with basal margin and cephalic half of lateral margin strongly sinuate, shape distinctly cuneiform; size much larger, length 9 to 12 mm. (15) *cordifera* Oliv.
- EE Elytra with basal and lateral margins at most only feebly sinuate; smaller species, length less than 9 mm. (except *impura*).
- F Elytra ferruginous with distinctly defined black spots; metasternum of males with two carinae terminating caudad in a tooth.
- G Elytra with basal black spots not impressed, elongate and widely separated from the suture; with a subapical black spot. (16) *sexpilota* Lec.
- GG Elytra with basal black spots concave, rounded, adjacent to the suture; with apical fifth black. (17) *isabellae* Hop.

- FF Elytra black or ferruginous without distinctly defined black spots; metasternum not dentate in either sex.
- G Short, stout, mostly black.
- H Elytra with humeral, triangular red spots.
(18) *scapularis* Van D.
- HH Elytra entirely black.
(19) *swainei* Hop.
- GG Elongate, pale, elytra ferruginous with two indistinct, somewhat darker lateral spots.
(20) *impura* Lec.
- AA Pronotum with basal angles obtuse.
- B Pronotum but little narrowed in front, broadly constricted in front and behind.
- C Pronotum with disk distinctly convex, basal transverse impression deep.
- D Pronotum with disk strongly convex, without lateral impressions; base of elytra very strongly sinuate, more or less cuneiform; forecoxal cavities open behind; first hind tarsal segment without pubescent sole.
- E Elytra black and testaceous, vestiture long and distinct on pronotum, distinct on elytra; pronotum and elytra rather finely punctured.
- F Form stout; pronotum opaque, closely punctured and hairy; elytra less than $2\frac{1}{2}$ times as long as wide; 3rd hind tarsi short, bilobed, cleft nearly to the base.
- G Pronotum with basal angles feebly but distinctly flaring, densely clothed with decumbent, bright golden pubescence.
(*Strophiona* Csy.)
- H Antennæ slender, segments 7 to 10 three times as long as wide; Eastern species.
(21) *nitens* Forst.
- HH Antennæ stout, segments 7 to 10 about twice as long as wide; Western species.
- I Rather slender species; pronotum, ♀, length equal to width, ♂, length distinctly greater than width; basal angles rounded and but feebly prominent, transverse basal impression rather shallow with margin not very sharply defined; elytra more sparsely punctured.
(22) *tigrina* Csy.
- II A stout species; pronotum, ♀, wider than long, ♂, as wide as long; basal angles subacute and prominent, transverse basal impression wide, deep, and abrupt.
(23) *laeta* Lec.
- GG Pronotum with basal angles parallel on the sides, not flaring, clothed with long, erect, pale pubescence. (*Xestoleptura* Csy.).
- H Antennæ stout; elytra with basal, transverse, black band straight and entire across the suture; antennæ, legs, and abdomen ferruginous.
(24) *crassicornis* Lec.
- HH Antennæ slender; elytra with basal black band, when present, interrupted or oblique; antennæ and legs black or testaceous.
- I Pronotum subopaque, very densely punctured, the basal transverse impression moderately abrupt, the median line usually strongly impressed; elytra closely punctured.
(25) *tibialis* Lec.
- II Pronotum shining, with the basal transverse impression not abrupt, the sides of the impression oblique, the median line at most only feebly impressed; punctation on pronotum and elytra only moderately close.
- J Base of elytra with scutellar lobe more strongly produced than the humeral; the hind tibiae of the male with only one well-developed spine.
(26) *crassipes* Lec.
- JJ Base of elytra with scutellar and humeral lobes equally and rather feebly developed; tibial spines normal.
(27) *behrensi* Lec.
- FF Form very slender, pronotum smooth and shining, very finely and sparsely punctured; elytra with predominating colour black, almost three times as long as wide; 3rd hind tarsi three times as long as wide and emarginate at apex.
(28) *octonotata* Say.

- EE Wholly black; vestiture of dorsal surface minute and indistinct; pronotum and elytra coarsely, closely, and roughly punctured; elytral apices rounded or feebly subtruncate. (29) *cockerelli* Fall.
- DD Pronotum with disk only moderately convex, with broad, lateral impressions; base of elytra very feebly sinuate, sides subparallel; eyes rather coarsely granulate; forecoxal cavities closed behind; first segment of hind tarsi with pubescent sole. (*Ortholeptura* Csy.)
- E Large species, more than 20 mm. in length; elytra more than five times length of the pronotum; apical transverse impression of pronotum smooth; dorsal lobe of eyes wide.
- F Elytral suture produced in a short spine. (30) *valida* Lec.
- FF Elytral apices rounded, not spinose. (31) *insignis* Fall.
- EE Smaller species, less than 20 mm. in length; elytra less than five times length of pronotum; apical impression of pronotum punctate, dorsal lobe of eyes narrow. (32) *obscura* n. sp.
- CC Pronotum with disk only feebly convex, the basal impression very shallow, subquadrate, the sides subparallel; elytra with base feebly crenulate.
- D Coxal cavities of prosternum widely open behind; head rather feebly constricted behind the eyes; 1st hind tarsal segment with pubescent sole; elytra with sides distinctly sinuate. (*Nivellia* Mulsant).
- E Elytra opaque, finely punctured and acutely granulate. (33) *aspera* Lec.
- EE Elytra shining, coarsely punctured, obtusely granulate. (34) *mutabilis* Newm.
- DD Coxal cavities of prosternum closed behind; head strongly constricted behind the eyes; 1st hind tarsal segment without pubescent sole; elytra with sides nearly straight.
- E Pronotum with sides subangulate before the middle; elytral punctures very close and coarse towards the base, the surface roughened; colour rufous or testaceous with tips black, with two very narrow, evanescent, longitudinal costæ. (35) *sanguinea* Lec.
- EE Pronotum with sides evenly arcuate; elytral punctures moderate in size; colour black or red.
- F Head with the tempora rapidly narrowed behind, not inflated; elytra shining black or bicoloured in the male, opaque red in the female with or without black spots. (36) *laetifica* Lec.
- FF Head with the tempora inflated, as wide as the eyes.
- G Elytra with sides subparallel, finely, rather sparsely, and not roughly, punctured, bright red, lustre opaque. (37) *lucifera* Hop.
- GG Elytra narrowed toward apex, rather closely, not coarsely, punctured, asperate more strongly toward apex, black with humeral angles red. (38) *haldemani* Csy.
- BB Pronotum strongly narrowed in front with the disk inflated.
- C Pronotum with basal and apical impressions wide and deep, basal impression abrupt, and with a median longitudinal impression.
- D Pronotum with median line narrowly impressed, canaliculate; 1st hind tarsus with pubescent sole.
- E The elytral base strongly lobed, the scutellar lobe narrowly rounded and strongly produced; the truncate elytral apices obtusely angled; entire body black. (39) *dolorosa* Lec.
- EE The elytral base feebly lobed, the scutellar lobe broadly rounded and feebly produced; the truncate elytral apices acutely angled; rufotestaceous. (40) *biforis* Newm.
- DD Pronotum with median line broadly impressed, not canaliculate; 1st hind tarsi without true pubescent sole.
- E Elytra with lateral margins bisinuate, strongly curved dorsally on the basal fifth; male with metasternum tuberculate on each side the middle line; pronotum angulate on the sides.
- F Pronotum with the disk broadly impressed on the sides between the very broad median sulcus and the side margins; the punctation very coarse and sparse.

- G Sides of elytra very strongly bisinuate, and strongly cuneiform, the sides concave from above; punctation very coarse, deep and close on basal half, small and shallow behind; pronotal pubescence long and pale; colour black throughout. (41) *atrata* Lec.
- GG Sides of elytra moderately bisinuate, the sides from above converging but straight; punctation as in *atrata*, but smaller and denser at the base; pronotal pubescence short and golden; elytra red with the apex black. (42) *liebecki* Hop.
- FF Pronotum with disk convex between the median sulcus and the side margins.
- G Pronotum with the sides strongly angulated at the middle; male with the last ventral segment very strongly triangularly cleft at the apex; female with the pygidium carinate on the middle line towards the apex. (43) *proxima* Say.
- GG Pronotum with the lateral inflation rounded; male with the last ventral segment flattened and subsulcate towards the apex; female with pygidium not carinate. (44) *minnesotana* Csy.
- EE Elytra with lateral margins feebly arcuate, not curved dorsally on the basal fifth.
- F Disk of pronotum subplanate although distinctly inflated, median line feebly broadly impressed; elytral apices obliquely truncate and emarginate; antennæ serrate.
- G Pronotum very coarsely confluent punctate, densely about the median impression, more sparsely on each side, with irregular, linear, smooth spaces, pubescence nearly black; elytra very coarsely, deeply, sparsely punctured, pubescence black, very short and indistinct. (45) *canadensis* Oliv.
- GG Pronotum uniformly, densely punctate, here and there indistinctly confluent, pubescence pale brown; elytra rather finely, closely punctate, pubescence distinct, recumbent, and light brown. (46) *planata* n. sp.
- FF Disk of pronotum strongly convex, median line strongly impressed; elytral apices transversely, narrowly truncate; pubescence of pronotum long and golden; elytral pubescence golden; antennæ not serrate.
- G Elytra densely clothed with bright golden, transverse pubescence, punctures minute and very dense. (47) *chrysocoma* Kby.
- GG Elytra rather sparsely clothed with short, pale, oblique pubescence, punctures rather coarse at the base and only moderately close, becoming smaller at the apex; usually with black, lateral and sutural vittæ. (48) *nigrolineata* Bland.
- CC Pronotum only margined in front, without wide and deep transverse apical impression, the basal transverse impression not abrupt, the disk without an impressed median line; the male with the abdomen inflated at the apex, and the last ventral segment excavated (except *vittata*, with last ventral feebly impressed).
- D Antennæ annulated, except rarely indistinctly so in *dehiscens* Lec.; elytra strongly dehiscent at apex, except feebly so in *circumdata* Oliv. (*Brachyleptura* Csy.)
- E Pronotum with a strong carina extending from the apex at the dorso-lateral margin diagonally towards the coxæ, giving the pronotum a subquadrate appearance as viewed from above; elytra distinctly more than twice as long as wide, obliquely truncate or emarginate at the apices, the sides strongly sinuate, ferruginous, usually opaque, moderately to coarsely and rather sparsely punctured; tempora very short, obliquely arcuate. (49) *rubrica* Say.
- EE Pronotum with sides narrowed regularly from middle to apex; without the diagonal carina described above.
- F Elytra with apices strongly dehiscent.
- G Tempora inflated, abruptly constricted and subangulate behind the eyes; elytra densely, finely punctured, ferruginous, the sides feebly sinuate. (50) *dehiscens* Lec.

- GG Tempora very short and obliquely arcuate behind the eyes; elytra very coarsely, rather sparsely, punctured except at the apex, black, ferruginous or bicoloured, the sides strongly sinuate. (51) *vagans* Oliv.
- FF Elytra feebly dehiscent at apex, testaceous, usually with apical and basal black marking, not densely but coarsely punctured, the sides strongly sinuate, apices angulate next the suture; length 7 to 8 mm. (52) *circumdata* Oliv.
- DD Antennæ black, not annulated; elytra at most only feebly dehiscent at apex.
- E Tempora very short behind the eyes; punctation of pronotum close; elytra black or with yellow and black transverse markings.
- F Elytra finely and densely punctured; the tempora obliquely arcuate.
- G Pronotal and elytral pubescence dark, entire body black. (53) *pernigra* Linell.
- GG Pronotal and elytral pubescence pale, elytra generally maculate, rarely entirely black. (54) *vexatrix* Mann.
- FF Elytra rather coarsely and sparsely punctured; entire body black; the tempora obliquely angulate. (55) *pubera* Say.
- EE Tempora oblique but produced far behind the eyes; pronotum and elytra polished, sparsely punctured; elytra narrow and elongate, strongly, transversely impressed on the scutellar lobes, generally black with testaceous vittæ on basal two-thirds or less. (Strangalepta Csy.) (56) *vittata* Oliv.

Judolia Mulsant, Col. Fr. Long., ed. 2, p. 496, 1863, has been recognized in recent European works as a distinct genus. The group has been left in this paper as a section of the genus *Anoplodera* Muls. *Judolia* applies in our fauna properly only to the *sexmaculata* group, including the species from *quadrata* Lec. to *amabilis* Lec. This section is so closely allied to the *carbonata* group on the one hand and to the *nitens* group on the other that it would seem improper to give *Judolia* generic status without at the same time treating the two groups just named, as well as several others, in the same way; so that the present genus *Anoplodera* would be divided into a series of distinct genera. We do not consider these groups equivalent in rank to the genera of the Lepturini recognized in this paper, and the recognition of so many genera, separated in many cases by what we consider to be minor differences, would probably confuse rather than simplify the classification. For the same reason we are opposed to the recognition of subgeneric names to this section of the Coleoptera. Unless a group is sufficiently distinct to require a separate generic name, we believe it better to refer to it as a *group* under the name of one of its most prominent species.

(1) *Anoplodera carbonata* Lec., 1860, Proc. Ac. Phil., p. 355.

Length 16 mm. ♂, 18 mm. ♀. Although closely allied to *A. nigrella* Say and *A. brevicornis* Lec. this species can be distinguished readily by the sparsely punctured disk of the pronotum.

The type has been examined by us and two specimens are before us, a male and a female, kindly sent us by Mr. Fisher. The elytra of the male are reddish brown, possibly immature. The antennæ are stout and short, but not clavate, hardly passing the elytral third; pronotum with strong, basal, transverse impressions, apical margination stronger than usual, the disk flattened, with broad impressions on each side in the female, smooth on the middle of the disk with sparse fine punctures, coarser at the sides, sides wider at middle; elytra rather closely punctate, moderately at base,

finer behind, base nearly straight. The last ventral segment is truncate-emarginate in the female, deeply emarginate in the male. The second specimen in Leconte's collection is possibly *brevicornis*, ♂; the third specimen is *nigrella*, ♀.

Host plant: *Populus trichocarpa*.

Type locality: "W.T."

- (2) *Anoploclera brevicornis* Lec., 1873, Smith. Misc. Coll., vol. XI, No. 264, p. 226.

Length 14 to 19 mm. The following is the original description:

"Nigra, sat robusta, opaca, capite dense, prothorace rude punctato, hoc campanulato, ad basin transversim profunde depresso, angulis posticis laminatis; elytris antice grosse, postice fortiter punctatis, apice oblique truncatis et breviter acuminatis; antennis (♀) brevibus, extrorsum crassioribus, articulis 8-10 crassities haud longioribus. Long. 19 mm.

Virginia City, Nevada; Mr. Edwards. Allied to *L. nigrella* Say, but much stouter, much more coarsely punctured, and with quite different antennæ; the 3rd joint is two and a half times as long as the 2nd, the 4th is two-thirds the length of the 3rd; the 5th is fully twice as long as the 3rd, the 6th and 7th shorter and wider, 8th, 9th, and 10th, stouter and shorter, almost wider than long, subtriangular, somewhat rounded, 11th larger, oval, rather pointed. The total length barely extends beyond the base of the prothorax."

A female has been compared with the type (♀) by Mr. C. A. Frost and later by the writers. The antennæ are very short and stout, widened distally in the female; pronotum with sides faintly arcuate, gradually narrowed from the base towards the front, faintly constricted at the apical margin, the disk moderately convex, coarsely confluent punctured, densely on the sides, not so closely midway between the sides and the middle line which is impressed and closely punctured in front, elevated and smooth behind; elytra stout with sides subparallel in the female, coarsely and deeply punctate in front, confluent towards the scutellum, finely and closely on the caudal half, broadly emarginate at the apex. The male, as is usual, has the antennæ much longer and strongly serrate; the last ventral segment is broadly emarginate.

Six specimens have been examined besides the type, all from California, although Washington is mentioned in literature. Leconte cites the type locality as Nevada, but the type bears the label "Calif." This species has been taken from old stumps of *Abies magnifica* by Dr. F. E. Blaisdell.

The second specimen in the Leconte collection under *carbonata*, ♂, "W.T.," is possibly this species.

Type locality: California (or Nevada?).

- (3) *Anoploclera nigrella* Say, 1825, Say, Ent., vol. 2, p. 335 (Lec. ed.).
lacustris Csy., 1891, Coleop. Notices III, Ann. N.Y. Acad. Sci., vol. VI, p. 43.
nigrita Say, 1837, Dej. Cat., 3rd ed.
praestans Csy., 1913, Mem. on the Coleop., vol. IV, p. 267.
serricornis Csy., 1924, Mem. on the Coleop., vol. XI, p. 279.

Length 13 to 19 mm. Say described the type as "brownish black," probably from an immature specimen. The form *praestans* Csy. has testaceous or reddish elytra and an apical, black, lateral margin. On one specimen from lake Abitibi this black margin is nebulous, and another example has the black colour spreading nebulously nearly to the suture on

the apices. The single type has red elytra. The name *nigrita* Say was given to a wholly black specimen. The male has the last ventral segment strongly emarginate, the female truncate, hardly emarginate.

The first two specimens of *A. lacustris* Csy. in the type series are small males, probably of *nigrella* Say, with the pronotum more densely punctured than usual and without smooth areas. The last two specimens are *sanguinea* Lec. *Strangalia serricornis* Csy. is apparently a small male of *nigrella* with red elytra. All our long series of *nigrella* are females, except one black male, which differs from *lacustris* only in colour, whereas all the *lacustris* in our collection prove to be males. Considerable variation was found in the length of the antennæ in both sexes. Occasionally males of this species may be found placed in series of *A. sanguinea*. They are much longer than *sanguinea* with the vestiture and prothorax entirely different.

Seventy specimens have been examined from New York, Nova Scotia, Ontario, Quebec, Michigan, Manitoba, Oregon, and British Columbia. In literature, Hudson bay, Washington, Nevada, Colorado, New Mexico, lake Superior, Georgia, and Maine are cited.

Host plants: *Pinus*, *Picea*, *Pseudotsuga* (Craighead).

Type locality: not given.

We append Col. Casey's original description of *lacustris* which appears to us to be a colour form of the male of *nigrella*.

Anoplodera (Brachyleptura) lacustris Csy.

"*L. lacustris* n. sp. Body, legs, and antennæ entirely black, the elytra pale brownish-testaceous, sometimes feebly infusate near the apex, lustre moderately shining; pubescence moderately long, very short on the elytra.

Male. Slender, very convex, head wider than long, the sides behind the eyes parallel for a short distance; hind angles right and narrowly rounded; surface feebly convex, densely and rather coarsely punctate; antennæ three-fourths as long as the body, rather stout. *Prothorax* as in *sanguinea*, rather coarsely, deeply, very densely punctate, with a narrow impunctate median line, the punctures nearly but not quite in mutual contact, the interspaces polished. *Elytra* two and one-half times as long as wide, at base one-third wider than the prothorax; sides gradually and distinctly convergent from base to apex, the latter very narrowly and obliquely truncate, the truncation deeply sinuate; disk rather densely and strongly punctate, the punctures becoming slightly finer toward apex. Length 9.0 to 11.0 mm.; width 2.8 to 3.6 mm.

Female. Moderately slender, smaller than the male, the upper surface much less convex. *Head* similar in form to that of the male, but with the surface very finely and excessively densely punctate and dull; antennæ more than one-half as long as the body, very slender. *Prothorax* similar in form to that of the male, but with the surface extremely densely punctate, and without trace of median impunctate line, the punctures scarcely smaller than in the male and very much larger than those of the head. *Elytra* scarcely more than twice as long as wide, at base rather more than one-third wider than the prothorax, the humeri distinctly rounded but much more prominent than in the male; sides almost parallel, feebly convergent toward apex, the apical truncation as in the male; disk very coarsely, deeply, densely punctate, the punctures becoming much finer toward the apex, coarser toward base than those of the male. Length 7.8 to 9.0 mm.; width 2.5 to 3.0 mm."

"Michigan (Marquette), Mr. Schwarz"

"This species is allied to *sanguinea* Lec., but differs in the much stouter male antennæ and in the radically different truncation of the elytral apices; the latter in *sanguinea* is rather broad, scarcely at all oblique, and is almost perfectly straight, the angles being blunt, in *lacustris* it is very much narrower, oblique, deeply sinuate and with angles, especially the exterior, very acute and prominent nearly as in *canadensis*. The sexual differences throughout the body are extremely and unusually marked, and in the series before me the females are decidedly smaller than the males."

- (4) *Anoplodera matthewsii* Lec., 1869, Ann. Nat. Hist., vol. IV, p. 384.
macrocera Casey, 1913, Mem. on the Coleop., vol. IV, p. 270.

Length 9 to 16 mm. This species occurs under the name *L. biforis* Newm. in collections. The stouter form of *matthewsii* Lec., the position of the black maculation, on the basal half of the elytra in *biforis* and on the apical half in *matthewsii*, in addition to the characters given in the key, will easily separate the species. The prothorax and antennæ are black in the females and reddish in the males. One male has the antennæ about twice the length of some of the others, an example, apparently, of the variation in antennal length in the same species. The male has the last ventral segment rounded or feebly emarginate, the last dorsal carinate. The first segment of the hind tarsi is densely pubescent beneath.

The type of *macrocera* Csy. is a male of *matthewsii* Lec. with rather coarse pronotal punctures; the 2nd specimen is a typical female of *matthewsii*.

Thirteen specimens were examined from British Columbia, Oregon, and the coast region of California.

Type locality: Vancouver island.

- (5) *Anoplodera grossa* Lec., 1874, S.M.C., vol. XI, No. 264, p. 225.

Length 13 to 17 mm. Generally found in the high Sierras of central California (Tulare and Fresno counties) at an elevation of 6,000 to 9,000 feet.

This species is entirely black; it is readily distinguished by the characters given in the key. The male has the last ventral rounded. The first segment of the hind tarsus is densely pubescent beneath. The type is a female.

Nine specimens have been examined, all from California.

Type locality: California.

- (6) *Anoplodera quadrata* Lec., 1874, Smith. Misc. Coll., No. 264, p. 225.

Length 9 mm.; the pronotum has the sides parallel on the basal two-thirds and the punctures very dense; the scutellum narrowly triangular and the elytra very broadly rounded, almost subtruncate, at the apex. The colour is dark brown, with median and postmedian lateral spots and the humeral margin on the elytra yellow, and the antennæ, legs, and the apex of the abdomen reddish.

Two specimens have been studied, the type and one in the U.S. National Museum, from Colorado.

Type locality: Saskatchewan.

- (7) *Anoplodera knulli* n. sp.

Length 9 mm.; a female, black, abdomen yellow, antennæ and legs reddish; pronotum as long as wide, the sides somewhat inflated in front of the middle, the hind angles acute, slightly wider than the inflation, the disk convex, the punctation close, the interstices usually narrower than the punctures, the pubescence rather long and erect, the basal impression deep on the sides of the disk and not continued across the dorsum, but interrupted by an extension of the disk, which bears a distinct median carina; the elytra subparallel, with apical half narrowed behind, the apices broadly, evenly rounded, rather sparsely punctate and shining, the

pubescence short and suberect, conforming to the colour of the elytral bands; the basal margin, the scutellum, the suture, and three transverse bands black, the intervening bands yellow, the bands subequal in width; the 1st band subbasal, yellow, from the side margin nearly to the sutural margin; 2nd, antemedian, black, from the side margin to the suture; 3rd, median, yellow, from the side margin nearly to the suture; 5th, anteapical, yellow, from the side margin nearly to the suture; 6th, apical, black; the antennæ feebly thickened apically, attaining the middle of the elytra.

One paratype, "Wyoming," agrees in colour with the type except that the yellow bands on the elytra are much narrower; one, "W. Terr.," has the legs and abdomen black; one, "Wyoming," has the last segment of the abdomen reddish. The median yellow band is angulate near the middle of the front margin and arcuate on the hind margin in all four specimens. The length varies from 7 to 9 mm. The male has the last ventral segment flattened at the apex.

Holotype, ♀, Yellowstone National park, VI-28-12, R. C. Osborn. In the Canadian National collection, Ottawa.

Paratypes, ♂, W. Terr.; ♂, Yellowstone park, Wyom.; ♀, Yellowstone park, Wyom., the last in the collection of Mr. J. N. Knull, Harrisburg, Pa., for whom the species is named.

- (7) *Anoplodera instabilis* Hald., 1847, Trans. Am. Phil. Soc., vol. X, p. 59.
convexa Lec., 1850, Jour. Phila. Acad. Sci., 2, vol. 1, p. 332.
vivarium Csy., 1924, Mem. on the Coleop., vol. XI, p. 282.
pacifica Csy., 1913, Mem. on the Coleop., p. 249, (♂).
trajecta Csy., 1913, Mem. on the Coleop., p. 250, (♂).
gaurotoides Csy., 1893, Ann. N.Y. Acad. Sci., vol. VII, p. 592, (♀).

Length 6 to 12 mm. *Anoplodera instabilis* presents a remarkable variation in size and in coloration. The general scheme of coloration in this species is black, with the elytra testaceous and marked with four, transverse, black bands, namely: a narrow basal band, a postbasal band at the basal third, a postmedian band immediately behind the middle, and an apical band across the apices. The apical band is entire in all our specimens; the median band is variably reduced to a transverse, rounded, lateral patch or spot; the postbasal band is commonly reduced to a diskal and a lateral spot, the diskal spot in some cases being obsolete and the lateral spot evanescent. The black form has been seen from North West Territories, Manitoba, Alberta, and Arizona, and a series from California is before us in which the black predominates on the elytra, reducing the yellow colour to spots. The spots are in some cases fused along the middle of each elytron so that the markings are more or less distinctly longitudinal.

Two specimens from Algonquin Park, Ont., have the elytra with red spots. Some black specimens have rufous abdominal segments. Many paired specimens are before us showing great variation in size and maculation in the same pair, and indicating that these colour forms are not even races, but individual variations of the same species, *instabilis* Hald.

The last ventral is rounded in the male, truncate-emarginate and flattened in the female. The first segment of the hind tarsus is densely hairy beneath. The pubescence of the pronotum is usually longer on the males than on the females.

A. gaurotoides Csy., is a black, rubbed female; *pacifica* Csy., a male with much yellow on the elytra; *trajecta* Csy., a brightly coloured male; *vivarium* Csy., a male; all apparently within the limits of this species.

Three hundred and fifty specimens have been examined from California, Oregon, Arizona, Colorado, Kansas, Montana, British Columbia, Alberta, Manitoba, North West Territories, and Ontario. In literature, New Hampshire, Idaho, Wyoming, Washington, Nevada, Kansas, New Mexico, and Saskatchewan are mentioned.

Host plants: *Pinus ponderosa* (Hopping), probably other pines.

Type locality: Oregon.

(9) *Anoplodera flaviventris* Sch., 1908, Bull. Brook. Inst., 1, p. 342.

Length 10 mm. The type has the elytra black, but a specimen before us (kindly loaned by Mr. H. W. Wenzel), although agreeing with the original description in every other particular, has the elytra banded black and yellow, much as in some forms of *instabilis* Hald. and the "flavous" parts are more or less reddish. Mr. Wenzel's specimen is a female from the same locality as the type.

We have also seen seven specimens, apparently the same species, four males and three females, from the Chirichua mountains, Arizona. Two males and two females were maculate, and two males and one female had the elytra entirely black. All had the flavous legs and abdomen except one male, which had the legs and abdomen a very dark brown, almost black. One female of the same species from Cochise county, Arizona, is entirely black.

If *flaviventris* Schaeffer is to be separated from *instabilis* Hald., the principal distinction will apparently be the short and very wide pronotum with the hind angles unusually prominent and the pronotal pubescence short and stout. The series we have placed under the name *flaviventris* has the colour throughout dark piceous to nearly black, but we have also a series of maculate specimens with a very wide pronotum and the vestiture of varying length. The flavous abdomen is common, although not invariable in the *flaviventris* series; but it is also found, less commonly, in the intergrading series and in typical *instabilis*.

Original description of *Anoplodera flaviventris* Schaeff.:

"Form of *instabilis*, black, moderately shining, antennæ, palpi, legs, and abdomen flavous. Head densely punctate, median line distinctly impressed; pubescence sparse, behind the eyes more evident on each side and pale. Thorax transverse, convex, broadly, transversely impressed at base, angulate at sides at slightly more than apical third, from the angulation to the basal angles arcuate-emarginate, basal angles divergent and prominent; base strongly margined; surface densely punctate; median line not strongly impressed; on each side, nearer the margin than the median line a shallow, round impression; pubescence pale and not very evident. Elytra slightly wider than the thorax at base; humeri rounded; sides gradually narrowing to apex; apices obtusely pointed; surface less densely punctate than the prothorax and covered with very short, dark pubescence. Metasternum rather densely punctate, abdomen sparsely punctate. Legs slender, first joints of hind tarsi as long as the next three and clothed with a few stiff, dark hairs. Length, head deflexed, 10 mm.; width across the base, 4.75 mm."

Huachuca Mountains, Arizona

I captured only a single female of this species near Carrs peak, on flowers at an elevation of about 8,000 feet. In form it is closely allied to *instabilis*, but readily separated from possible black forms of that species by the flavous legs and abdomen. Casey's *guarotoides* is an entirely black species with the scutellum truncate behind."

- (10) *Anoplodera sexmaculata* Linn., 1758, *Systema Naturæ*, ed. 10-1, p. 398.
seminigra Csy., 1924, *Mem. on the Coleop.*, vol. XI, p. 283.

Length 8 to 11 mm. This species, described over 160 years ago, may still be found in many collections in series of *instabilis* Hald. It may be distinguished from *instabilis* by the less robust form and the other characters given in the key, and by the mesal portion of the postbasal black band being reduced to a longitudinal spot, usually covering the suture. The last ventral and last dorsal segments are rounded in both sexes. *L. seminigra* Csy. is a female, black, with narrow yellow bands.

Two hundred and six specimens have been seen from British Columbia, Alberta, Manitoba, Quebec, Ontario, New Brunswick, Massachusetts, Minnesota, Michigan, and Washington. Colorado, New Hampshire, and northern California are also cited in literature. The species is found throughout the northern hemisphere.

Type locality: Europe.

- (11) *Anoplodera tribalteata* Lec., 1874, *S.M.C.*, No. 264, p. 224.
serpentina Csy., 1891, *Ann. N.Y. Acad. Sci.*, vol. VI, p. 41.

Length 8 to 12 mm. There is considerable variation in the transverse markings of the elytra. *A. tribalteata* can easily be recognized by the profuse, bright, golden-yellow vestiture. The last ventral is broadly rounded, the last dorsal feebly emarginate.

Anoplodera serpentina Csy. is possibly a distinct species, differing from *tribalteata* in the much longer and more slender antennæ, attaining the posterior margin of the third black, elytral band or beyond in the male and well beyond the middle of the elytra in the female. The type (♂) and No. 3 in the type series have the elytra coarsely, sparsely punctate and shining, whereas Nos. 2 and 4 have the elytra closely, finely punctate, as usual in *tribalteata*. The type has the pronotum impressed on the median line, with small, rather sparse punctures. These characters are somewhat variable in *tribalteata*.

Forty-seven specimens were examined from Hope mountains, British Columbia, and California. Other localities cited in literature: Nevada and Idaho.

Type locality: Owens valley, California.

- (12) *Anoplodera coquilletti* Linell, 1898, *Proc. U.S. Nat. Mus.*, vol. XIX, p. 398.

Dr. Van Dyke states that *coquilletti* is only a form of *tribalteata* Lec. The authors have before them a male from Mr. Linnell's type series which appears doubtfully distinct. The vestiture is shorter and of different colour. The necessity for the collection of paired specimens in the field is here exemplified. *L. coquilletti* is a southern form certainly very closely related to *tribalteata* Lec.

Type locality: Wilson Peak, Los Angeles county, California.

- (13) *Anoplodera amabilis* Lec., 1857, *Ent. Rept.*, p. 64.

Length 5 to 9 mm. A little known species, smaller and more slender than *tribalteata* Lec., without the golden vestiture, especially on the testaceous maculation of the elytra. The antennæ are longer and more slender than in *tribalteata* and the yellow elytral bands are in many cases reduced to spots, as occurs in the type. The last dorsal and ventral segments are emarginate in the female, rounded in the male.

It has been found from middle California northward to British Columbia.

Forty-five specimens were examined from California, Oregon, Washington, and British Columbia.

Host plant: *Pinus ponderosa* (Hopping).

Type locality: Steilacoom, Washington.

- (14) *Anoplodera barberi* Fall, 1907, Trans. Am. Ent. Soc., vol. XXXIII, p. 250.

Length 8 to 9 mm. The original description of the species is quoted in full:

"Entirely black, head and prothorax dull from the density of the punctation, elytra shining. Pubescence fine, fuscous, very short and inconspicuous on the elytra, longer and erect on the prothorax. Head elongated anteriorly, tempora moderate, a little oblique. Antennæ slender, filiform, and cylindrical, as long as the body (σ), fourth joint three-fourths as long as the third, the latter subequal to the fifth, eleventh not appendiculate. Prothorax subparallel in basal two-thirds, thence narrowed to the apical constriction; base broadly bisinuate, margined, but not constricted or impressed; hind angles small, acute, abruptly produced, surface very densely punctate, a short, smooth, impunctate line behind the middle. Elytra nearly twice as wide as the basal width of the thorax (exclusive of the angles), strongly narrowed posteriorly, the tips rounded and dehiscent; disk strongly convex at base, the entire surface with not very coarse, sharply impressed punctures, which are distant from one to two times their own diameters. Beneath with rather longer greyish pubescence. Length 8 to 9 mm.

Type locality, Fieldbrook, Humboldt county, Calif.

The type is a male collected at Fieldbrook, Humboldt county, California, by Mr. H. S. Barber. With it I have associated examples taken on the Kern river (elevation 6,000 feet) by Mr. Dagget, and in western Nevada by Prof. Baker.

The fifth ventral segment is nearly similarly narrowly truncate in both sexes, the female differing from the male only in the shorter antennæ and more robust form.

Barberi should probably enter the first group (Leng's Aa) of the genus, but differs from anything therein by the relatively narrow prothorax, resembling certain *Acmaeops* in this respect."

Examples of this species are usually entirely black, although Mr. Hopping has one, taken at an elevation of between 6,000 to 7,000 feet in Sierra Nevada mountains, that has one yellow antemedian spot on each elytron.

Six specimens examined from Tulare, Fresno, and Plumas counties, California.

Type locality: Humboldt county, California.

- (15) *Anoplodera cordifera* Oliv., 1795, Ent., IV, p. 25.

lunaris Hald., 1847, Trans. Am. Phil. Soc., (2), vol. XI, p. 59.

deceptiva Csy., 1924, Mem. on the Coleop., vol. XI, p. 283, (φ).

longior Csy., 1924, Mem. on the Coleop., vol. XI, p. 284, (σ).

Length 9 to 12 mm. The maculation of the elytra of this species seems to be fairly constant, with the apices black, a large black spot just behind the middle and a smaller basal one, sometimes evanescent, near the lateral margin. The first segment of the hind tarsus is densely hairy. In the female the last dorsal and ventral segments are broadly emarginate; in the male the last ventral is elevated broadly at the middle and deeply excavated on the apical half. *L. longior* Csy. is a strongly cuneate male with long antennæ.

Twenty-nine specimens were examined from Pennsylvania, New York, Massachusetts, New Jersey, and Ohio. Other localities cited in literature: New Hampshire, Virginia, North Carolina, Georgia, Maryland, and Michigan.

Type locality: "Amer. boreal."

- (16) *Anoplodera sexspilota* Lec., 1859, Proc. Acad. Phila., p. 80.
minuta Csy., 1924, Mem. on the Coleop., vol. XI, p. 284.

Length 5 to 8 mm. This species seems to be confined to the regions of California south of San Francisco, and possibly eastward to Texas.

The pattern of the maculation appears to be fairly constant in all specimens we have seen. The apical segments of the abdomen are rounded in both sexes; the 1st segment of the hind tarsi is densely hairy beneath. *L. minuta* Csy. may eventually prove to be distinct.

Twenty-four specimens have been examined from the region between San Francisco and San Diego, California.

Type locality: Fort Tejon, California.

- (17) *Anoplodera isabellae* Hopping, 1922, Can. Ent., July, p. 162.

Length 6 to 8 mm. This species has been found in collections under the name *sexspilota* Lec. It differs from *sexspilota* distinctly in the characters given in the key.

Seven specimens examined, one from Nevada and six from California.

Type locality: Isabella, Kern county, California.

- (18) *Anoplodera scapularis* Van D., 1920, Brook. Ent. Soc., vol. 15, p. 43.

Length 8 mm. Only the type is known.

Original description of *Anoplodera scapularis* Van Dyke:

"Short, black, with triangular, orange red patches at the humeri and a small, tail-like appendage extending onto the epipleurae, with short, rather sparse grey pile covering all of the body except the black portions of the elytra and most evident on the pronotum and underside, and a black pile covering the black parts of the elytra. Head with mouth-parts but moderately prolonged, broad between the eyes, not very suddenly constricted back of eyes, with a broad neck, coarsely, densely punctate, opaque; antennae moderately stout and extending slightly beyond middle of body. Prothorax campanulate, as broad as long, three-fourths as broad as base of elytra, base twice as broad as apex, transverse basal impressions shallow, posterior angles short, narrow, and extending directly outwards. Sides not dilated in front of middle, the disk closely, coarsely punctate and opaque. Scutellum rather finely punctate. Elytra twice as long as broad, humeral angles rounded and not very prominent, sides a bit arcuate and slightly convergent to apex, apices obliquely truncate, disk distinctly and moderately punctate. Length 8 mm., breadth 3 mm.

Type, as unique in my collection, captured at Havilah, California, June 19, 1905, by Mr. Fordyce Grinnell.

This very distinctly marked *Leptura* would come in our tables perhaps just before *L. sexspilota* Lec. The prothorax is of about the same type as in that species, although the insect is as a whole somewhat larger, generally more robust and with an entirely different colour pattern, not only from that but from any having a similar shaped prothorax. Some few of our *Lepturas* have the humeri often with triangular patches of red, as for instance an occasional *L. canadensis* Fab., a male of *L. laetifica* Lec.; and so forth, but these all differ very greatly from this otherwise. The species is evidently extremely local or else very rare as this is the only specimen that I have seen."

Type locality: Havilah, California.

- (19) *Anoplodera swainei* Hopping, 1922, Can. Ent., July, p. 163.

Length 7.5 to 8 mm. This species is of the form and size of *sexspilota*, black, with the legs and antennae more or less testaceous. The

last ventral segment of the male is broadly emarginate. Only the type, male and female, in the National collection at Ottawa, and one in the collection of Mr. Ralph Hopping, are known to us.

Type locality: Kaweah, Tulare county, California.

(20) *Anoplodera impura* Lec., 1857, Ent. Rep., p. 64.

Length 10 mm. A rather rare species of restricted distribution in high altitudes. The type was probably taken in the high mountains east of Sacramento, California; localities in those days in many cases being given as the nearest town. The last ventral segment in the male is truncate and broadly sulcate.

Represented in the National Museum collection, Washington, by a pair from Sylvania, California; the female stouter with elytral spot pale but distinct, with its margin rather well defined, the male with the elytral spot small and indistinct.

Three specimens have been before us from Fallen Leaf lake and Disco, California. Other localities cited in literature: Nevada and Oregon.

Type locality: Sacramento, California.

(21) *Anoplodera nitens* Forst., 1771, Nov. Spec. Ins., p. 45.

zebra Oliv., 1795, Entomologie, vol. IV (73), p. 19.

carolina Web., 1801, Obs. Ent., i, p. 91.

quagga Germ., 1824, Ins. Lep. nov., p. 521.

zebrata Hald., 1847, Trans. Am. Phil. Soc., (2), vol. X, p. 82.

bellina Csy., 1913, Mem. on the Coleop., vol. IV, p. 265, (♂).

Length 11 to 15 mm. This species may always be distinguished from the western *laeta* Lec. by its much more slender antennæ.

Twenty-six specimens were examined from Ontario, Quebec, Pennsylvania, and Massachusetts. Other localities mentioned in literature are: New York, North Carolina, New Jersey, Illinois, Texas, Iowa, Georgia, and Colorado (*bellina* Csy.).

Host plants: Oak (Bland, Felt), Black oak (Horn), *Castanea*, *Quercus* (Craighead), *Hicoria* (J.M.S.).

(22) *Anoplodera tigrina* Csy., 1913, Mem. on the Coleop., vol. IV, p. 266.

reducta Csy., 1913, Mem. on the Coleop., vol. IV, p. 266.

Length 10 to 12 mm. The basal transverse impression on the pronotum is less deeply excavated, the vestiture shorter and sparse, the prothorax narrower and the basal angles less acute than in *A. laeta*, with the elytra more sparsely punctured at the base, and the pronotum of the male longer than wide. The type is a male. *A. reducta* Csy. is a smaller male, probably of the same species. Although probably breeding in oak, like *nitens* and *laeta*, *tigrina* is generally found on Mariposa lilies (*Calochortus*).

Eight specimens were examined from Santa Barbara, Tulare, and Fresno counties, California.

Type locality: Los Angeles, California.

(23) *Anoplodera laeta* Lec., 1857, Ent. Rep., p. 64.

ostenta Csy., 1913, Mem. on the Coleop., vol. IV, p. 265.

Length 9 to 16 mm. This species breeds in oak and is found from Sacramento, California, to Victoria, British Columbia. On account of the

absence of native oak on the mainland of British Columbia it may prove to be confined, in that province, to Vancouver island. *A. ostenta* Csy. has the pronotum very densely punctured, but is probably not distinct.

Forty-two specimens were examined from California, Oregon, and British Columbia. Other localities cited in literature are: Oregon, Washington, and Nevada.

Host plant: Oak (Downes).

Type locality: Sacramento, California.

- (24) *Anoplodera crassicornis* Lec., 1875, S.M.C., vol. XI, No. 264, p. 227.
corrusca Csy., 1913, Mem. on the Coleop., p. 261.

Length 11 to 15 mm. This species is very evidently distinct from *A. crassipes* in punctation and in the rufous prothorax of the females. The male has two hind tibial spurs, that of *A. crassipes* only one. The elytral, basal, black marking is transverse in *crassicornis* and oblique in *crassipes*. The antennæ are exceptionally stout in *crassicornis* and in the males strongly serrate. Both species may be found in the same meadow, but never associating and easily distinguished on sight in the field.

Sixteen specimens are before us, two from Oregon and fourteen from California, and others have been seen in various collections.

A specimen in the collection of Mr. J. N. Knull was compared with the type of *crassicornis* by Mr. Knull and found to be the same. This specimen agrees specifically with the type of *corrusca* in the Casey collection.

Type locality: California (Mr. Ulke).

Type locality of *corrusca*: Giant Forest, Tulare county, California (type collected by Ralph Hopping).

- (25) *Anoplodera tibialis* Lec., 1850, Jour. Acad. Nat. Sci. Phila., (2), I, p. 339.
hirtella Lec., 1873, Smith. Misc. Coll., vol. XI, No. 264, p. 226.
columbica Csy., 1913, Mem. on the Coleop., vol. IV, p. 261.
pictipennis Csy., 1924, Mem. on the Coleop., vol. XI, p. 285.
miquelonensis Pic., 1921, l'Échange, vol. 37, p. 11.

Length 10 to 14 mm. Mr. C. A. Frost very kindly compared for us a male of *tibialis* with the type of *hirtella* Lec. and considered them the same species. Dr. E. C. Van Dyke¹ says, "*Leptura hirtella* Lec. This is merely the male of *L. tibialis* Lec., the latter name having priority by many years." A recent examination of the types by the writers confirms this view; although it should be noted that *hirtella* has the elytra more finely, densely punctured than usual in *tibialis*, the tips of the elytra hardly truncate, the pubescence on pronotum and elytra long and dense, with elytral spots only at and just before the tip.

The colour pattern on the elytra in *tibialis* is typically yellow or reddish, with four transverse black bands arranged as follows: first, postbasal, directed meso-caudad; second, median; third, postmedian, directed meso-cephalad; fourth, apical. The anterior band is variably reduced to spots in some specimens and in the males is in many cases obsolete, with the

¹ Bull. Brook. Ent. Soc., vol. 15, 1920, p. 44.

last two bands more or less completely confluent. This species seems to be most abundant on the Pacific slope. It is generally found at high elevations on species of *Umbelliferae*.

Two hundred and one specimens have been examined from British Columbia, Oregon, Alberta, Idaho, Montana, and Michigan. New Hampshire, Ontario, and Newfoundland are also given in literature.

Type locality: St. Ignace, lake Superior. The type locality of *hirtella* is Labrador.

Leptura miquelonensis Pic.; l'Échange, vol. 37, p. 11, 1921.

"*Leptura miquelonensis* n. sp. Oblongus, postice attenuatus, luteo pubescens, niger tibiis ad basin tarsisque pro parte testaceis, elytris testaceis, postice ante apicem transverse nigro fasciatis, et apice nigro notatis. Long. 13 mill. Saint-Pierre et Miquelon.—Ressemble un peu à *L. fulva* Deg. avec la tête plus grosse, l'avant-corps assez densément pubescent et les élytres fasciés de noir avant le sommet, cette fascie interrompue à la suture."

It is not possible to place this species definitely from the description, but it is probably a male of *tibialis* Lec.

(26) *Anoplodera crassipes* Lec., 1857, Ent. Rept., p. 65.

muleibris Csy., 1913, Mem. on the Coleop., vol. IV, p. 263.

fasciventris Lec., 1861, Proc. Acad. Nat. Sci. Phila., p. 355.

vancouveri Csy., 1913, Mem. on the Coleop., vol. IV, p. 263, (♀).

xanthogaster Lec., 1859, Proc. Acad. Nat. Sci. Phila., p. 88.

var. *shastana* Csy., 1913, Mem. on the Coleop., vol. IV, p. 263, (♂).

Length 9 to 14 mm. The great difference in this species between the sexes, the great variety of maculation, the variation in the punctuation and the subtruncate, evenly or acutely rounded elytral apices, have led to many specific descriptions. This is the only species in the group known to us having but one spur on the posterior tibia of the male.

The elytra are testaceous or reddish, typically with four black bands, much as in *crassicornis* and *tibialis*, the first band directed obliquely caudad, the other three transverse. The first two bands are variably reduced to spots, and in the male the first two bands are in many cases nearly obsolete, with the last two more or less confluent, in some cases covering nearly the caudal half of the elytra. The males are usually much smaller than the females. Many pairs collected in the field have been examined in this study.

L. muleibris Csy. has minor distinctions, such as the smaller punctures of the metepisternum and the less strongly produced scutellar lobe; it may prove to be a distinct species.

Two hundred and sixty-seven specimens have been examined from Colorado, Utah, Idaho, California, Oregon, Washington, and British Columbia. In literature, Nevada also is cited.

Host plant: *Pinus* (Craighead).

Type locality: Steilacoom, Washington.

(27) *Anoplodera behrensii* Lec., 1873, S.M.C., No. 264, p. 227.

Length ♂, 10 mm., ♀, 15 to 17 mm.

Le Conte¹ says: "This species is apparently the Western analogue of *A. octonotata* but is much larger and the spots differently formed and arranged."

¹ Smith. Misc. Coll., vol. XI, p. 227 (1874).

The females we have seen are much larger than the unique male examined by us, and are much longer than the females of *crassipes* Lec., with the sides of the elytra parallel and the abdomen black. Our single male has the elytra narrowed toward the apex and the abdomen rufous. This species is apparently rare in collections and the females of *A. tibialis* Lec. are in some cases confused with it. The pronotum is opaque in *tibialis* and shining in *behrensi*.

Eight specimens have been studied from Washington, Oregon, and British Columbia. California is also cited in literature.

Type locality: Mendocino county, California.

- (28) *Anoplodera octonotata* Say, 1823, Jour. Acad. Nat. Sci. Phila., vol. 3, p. 419.

stictica Newm., 1841, Ent., p. 72.

quadripunctata Hald., 1847, Trans. Am. Phil. Soc., vol. X, p. 64.

Length 10 to 12 mm. Mr. Leng gives 10 to 20 mm. This is a black, shining species, the elytra typically with four pairs of irregular or triangular fuscous spots, the first pair basal, the second before the middle, the third behind the middle, the fourth before the apex. In some specimens the elytral spots are reduced in number and in others they may be larger and nearly or quite confluent.

Fifteen specimens were examined from North Carolina, Pennsylvania, Ohio, Ontario, and Massachusetts. Other localities cited in literature: Virginia, Alberta, Mississippi, Illinois, "Canada West," New York, and Wisconsin.

Host plant: "Hickory?" (Bland).

Type locality: Mississippi.

- (29) *Anoplodera cockerelli* Fall, 1907, Trans. Am. Ent. Soc., vol. XXXIII, p. 251.

Length 9 to 13 mm. We have seen this species in collections under the name *carbonata* Lec., which is an entirely different species. *A. cockerelli* is entirely black, shining, and varies somewhat in punctuation. One specimen, kindly loaned us by Mr. Chas. Liebeck, has the elytra somewhat bluish.

Professor H. F. Wickham informs us that his specimens from Colorado, reported as *carbonata* Lec., are actually *cockerelli* Fall, which had not been described at that time.

Four specimens examined from New Mexico, Arizona, and Colorado.

Type locality: Beulah, N.M.

- (30) *Anoplodera valida* Lec., 1857, Ent. Rept., p. 64.

oculea Csy., 1913, Mem. on the Coleop., vol. IV, p. 204, (♂).

Length 21 to 24 mm. This species is very common in Sierra Nevada mountains, central California. The black markings vary greatly in different specimens and with freshly emerged individuals are in many places very faint. The type of *oculea* Csy. is a narrow male, probably not distinct from *valida* Lec.

Fifteen specimens were examined from California, Washington, and British Columbia. Other localities cited in literature: Nevada and Oregon.

Host plants: *Pinus ponderosa* Laws., *Tsuga*, *Abies* (Craighead).

Type locality: Shoalwater bay, Ore.

- (31) *Anoplodera insignis* Fall, 1907, Trans. Am. Ent. Soc., vol. XXXIII, p. 251.

Length 20 to 25 mm. This species, although resembling *valida* Lec., may be easily distinguished by its rounded elytral apices. It is apparently very local in its distribution.

Only four specimens were seen, all from Monterey, California.

Type locality: Monterey, California.

- (32) *Anoplodera obscura* n. sp.

Length 17 mm., length of elytra, 11 mm., width of elytra, 5 mm., width of pronotum, 3.5 mm., length of pronotum, 3 mm. Colour reddish throughout, with eyes and indistinct transverse markings on the elytra black. Head closely punctured, tempora inflated and strongly constricted, eyes rather coarsely granulate, strongly emarginate, the dorsal lobe relatively narrow, antennæ stout and short, less stout than in *crassicornis* and not serrate; the pronotum with broad median and lateral impressions, and oblique subcarinate elevation on each side before the middle, punctures small, rather sparse on centre of the disk, close in front and on the sides, with deep apical and basal transverse impressions, the apical impression roughened by punctures; the scutellum closely punctured, broadly rounded at the apex; the elytra with the sides parallel, the apex rounded at the outer angle, feebly mucronate at the sutural angle; punctures small and close, pubescence short, pale, suberect, two feeble costæ on each side, the sides and base mostly yellowish, the disk reddish, with antemedian and median lateral black spots merging into the dark reddish disk, which becomes darker behind, suggesting a normal colour pattern of three oblique black bands on a yellow or reddish background.

This species is closely allied to *valida* Lec. and *insignis* Fall through the characters of the pronotum and the base of the elytra. The pronotum in these species is subquadrate, moderately convex, strongly impressed in front and behind, along the middle line and on the sides of the disk; the fore-coxal cavities are completely closed behind, and the first segment of the hind tarsi is densely pubescent beneath.

Holotype, ♀, Blue mountains, Wash.; C. V. Piper, 21-vii-96, (16). In the collection of the U.S. National Museum, Washington, D.C.

- (33) *Anoplodera aspera* Lec., 1873, S.M.C., No. 264, p. 228.

var. *parkeri* Hipp., 1822, Can. Ent., vol. XIV, p. 66.

Length 10 to 14 mm. This species is easily recognized by the opaque lustre and the peculiar granulate punctation of the elytra. It is usually entirely black, but two specimens have been seen from Terrace, B.C., of the type of *parkeri* Hipp., and also one other with the elytra reddish-testaceous. These specimens, kindly loaned by Mr. C. A. Frost, appear to be identical with *aspera* Lec. except for the lighter colour on the elytra, a character of doubtful value in this genus.

Sixty-four specimens have been examined from New Mexico, Colorado, Alberta, and British Columbia. Other localities given in literature are Idaho and Michigan. The Michigan record may refer to *Anoplodera mutabilis* Newm.

Habitat: Rocky Mountain region and west to the Pacific coast.

Host plant: *Betula* (Craighead).

Type locality: Vancouver island, B.C.

- (34) *Anoplodera mutabilis* Newm., 1841, The Ent., vol. 1, p. 71.
luridipennis Hald., 1847, Trans. Am. Phil. Soc., vol. X,
 p. 63.
quadricollis Lec., 1850, Jour. Acad. Phil., ser. 2, vol. 1,
 p. 339.

Length 8 to 13 mm. In both males and females the elytra may be either testaceous or black. Testaceous specimens in many cases have a dusky black area near the apices of the elytra and were called *luridipennis* by Haldeman. The elytra present considerable variation in width, and in the density of the punctation. *A. quadricollis* Lec. is a male of *mutabilis* Newm., but with the pronotum almost exactly square, and with denser and longer golden pubescence.

The two species, *aspera* Lec. and *mutabilis* Newm., are distinguished from the rest of the genus *Anoplodera* Muls. by the following combination of characters; the quadrate pronotum, open forecoxal cavities, and the pubescent sole on the first segment of the hind tarsi. These characters indicate relationships with *Pidonia* Muls. and *Acmaeops* Lec. The convex prosternum, on the other hand, and other characters, require that the group be retained near the genus *Anoplodera*. It is more convenient now to include it in *Anoplodera*; but it may eventually be removed as a separate genus.

One hundred and twenty-three specimens have been examined from New York, Minnesota, Michigan, Massachusetts, Ontario, and Quebec. Other localities mentioned in literature: Newfoundland, New Mexico, New Jersey, and Pennsylvania.

Host plants: *Quercus*, *Betula*, *Acer*, *Castanea* (Craighead).

Type locality: Trenton Falls, N.Y.

- (35) *Anoplodera sanguinea* Lec., Proc. Acad. Nat. Sci. Phila., p. 89.
boulderensis Csy., 1913, Mem. on the Coleop., vol. IV,
 p. 252.
apicata Csy., 1924, Mem. on the Coleop., vol. XI, p. 280.

Length 8 to 11 mm. The elytra are generally testaceous in the males and reddish in the females; the latter are usually slightly larger. This species seems to be more commonly found in the west than in the east. *Strangalia apicata* Csy. is a male, evidently of *sanguinea* Lec. The type of *boulderensis* Csy. is a typical female of *sanguinea*.

One hundred and forty specimens were examined from Colorado, New Mexico, California, Oregon, British Columbia, Manitoba, Ontario, and Quebec. Other localities cited: Washington, Nevada, New Hampshire, Pennsylvania, and Michigan.

Host plant: *Pinus ponderosa* (Hopping).

Type locality: "Wash. Ter."

- (36) *Anoplodera laetifica* Lec., 1859, Proc. Acad. Nat. Sci. Phila., p. 89.
lugens Lec., 1859, Proc. Acad. Nat. Sci. Phila., p. 89.
provencheri Auriv., 1912, Cat. Coleop., pt. 39, p. 223.

Length 8 to 11 mm. The males have the elytra shining, coarsely punctured, generally wholly black; but a series collected by Mr. Hopping in Fresno county, California, paired with typical females, have the elytra with testaceous markings. Black males were taken at the same time and place. The females have the elytra opaque, finely punctured, bright red, with the basal spots near the suture and the median diskal spots black.

One hundred and thirty-eight specimens have been examined from California, Oregon, Washington, British Columbia, and Idaho.

Type locality: "Shoalwater bay, Oregon and Washington Territory."

- (37) *Anoplodera lucifera* Hopping, 1922, Can. Ent., July, p. 164.

Length 10 to 13 mm. Only two specimens are known. It resembles *A. sanguinea* Lec. in colour; body black with bright red, opaque elytra, which are much longer in proportion than those of *sanguinea*.

Type locality: Cochise county, Arizona.

Since this species was described, Mr. H. W. Wenzel has sent us a specimen for examination, which, although smaller, 10 mm., is very evidently the same species. It was taken in Jemez mountains, N.M., and in the same collection there is a typical specimen of *haldemani* Csy. of the same place and date. This species may possibly prove to be the female of *A. haldemani* Csy.; but there are greater differences between these two forms than exist between the sexes of any species of *Anoplodera* known to us except possibly *laetifica* Lec. The elytra of *haldemani*, in addition to the great difference in colour, are rather closely punctured and asperate, whereas the elytra of *lucifera* are not at all asperate and not closely punctured.

- (38) *Anoplodera haldemani* Csy., 1892, Ann. N.Y. Acad. Sci., vol. 6, p. 42.

One specimen from Jemez mountains, New Mexico, was sent us by Mr. H. W. Wenzel for determination. It agrees with Colonel Casey's very good description and is, like the type, a male. Length, 10.5 mm.

Original Description

"*L. haldemani*, n. sp. Slender and rather convex, intense black throughout the body, legs, and antennæ, the elytral humeri obliquely red; lustre moderately shining, pubescence short, sparse, and inconspicuous. Head wider than long, the tempora and base nearly as in *sanguinea*; surface flat, very densely punctate; antennæ (male) nearly as long as the body, rather stout. Prothorax much longer than wide, as in *sanguinea*, but much less inflated or subangulate at the middle; disk rather coarsely, deeply and less extremely densely punctate, the punctures in close mutual contact, without distinct median impunctate line except very narrowly toward base, the line generally with a very fine impressed stria. Elytra between two and three times as long as wide, at base nearly one-half wider than the prothorax, the humeri rounded but rather prominent; sides evenly and rather strongly convergent from base to apex and straight; each elytron narrowly truncate at apex, the truncation slightly oblique and straight or extremely feebly sinuate, the angles obtuse; disk not very coarsely or densely punctate, the punctures deep and perforate toward base, becoming finer and more or less asperate toward apex, in some cases with traces of two narrow impunctate lines toward base. Under surface very finely and densely punctate, more conspicuously pubescent.

Length 9.0 to 10.5; width 2.5 to 3.0 mm.

Type locality; New Mexico.

The two specimens are males, and are from the Levette cabinet. The species is allied to *sanguinea*, but differs greatly in coloration and punctation, and in the more narrowly and obliquely truncate elytral apices. The red humeral maculation is similar in form to that of *Acmaeops basalis*."

- (39) *Anoplodera dolorosa* Lec., 1861, Proc. Acad. Phila., p. 355.

Length 10 to 15 mm. This is an entirely black species.

Seventy-two specimens have been examined from California, Oregon, Washington, British Columbia, and Idaho.

Type locality: East of Fort Gibbs (Wash.), collected by Mr. Gibbs while on the Northwestern Boundary Survey.

- (40) *Anoplodera biforis* Newm., 1841, Ent., p. 70.

laurentica Csy., 1913, Mem. on the Coleop., vol. IV, p. 271. (♂).

Length 11 to 15 mm. Le Conte¹ speaks of the extremely long male antennæ, the elytra without dark apices and with the postmedian spot reduced to a small cloud. We have seen one specimen with an entire absence of maculation and without the apical black or dark coloration. The antennæ, prothorax, legs, and ventral aspect are generally rufous. One male had the antennæ twice the length of the body, but this extreme is unusual.

Twenty-six specimens were examined from Pennsylvania, New York, Massachusetts, Ontario, and Quebec. Other localities cited in literature: Virginia, "Can. West."

Host plant: *Castanea* (Craighead).

Type locality: Trenton Falls, N.Y.

- (41) *Anoplodera atrata* Lec., 1850, Jour. Acad. Nat. Sci. Phila., (2), vol. 1, p. 338.

Length 10 mm. Mr. R. P. Loding of Mobile, Alabama, has sent us a black species which agrees with LeConte's type of *atrata*. The type of *atrata* has the elytra dark brown, nearly black. It appears definitely distinct from *A. proxima* Say, to which it is closely related, by the much coarser punctation of the pronotum and elytra, and the broad impression on each side on the disk of the pronotum. The elytra are wide at the base, short, strongly cuneiform, with the apices broadly almost transversely truncate and hardly emarginate at the apex. The elytral vestiture is golden, short, and coarse, whereas that of *proxima* is longer and finer. The type has the left elytron broken at the apex and the abdomen missing. It is probably a male; the antennæ are slender.

One specimen examined from Alabama, in addition to the type.

Type locality: Georgia.

- (42) *Anoplodera liebecki* Hop., 1922, Can. Ent., vol. LIV, p. 164 (*Anthophilax*).

Length 11 to 14 mm. This species is very closely allied to *atrata* Lec., with the side margins of the pronotum very strongly angulate. The elytra of *liebecki* are less coarsely and more densely punctate on the basal half and are deep red with the apices black, and the side margins, viewed from the side, are distinctly less strongly bisinuate, so that the elytra appear less strongly cuneiform as viewed from above. The pubescence of the pronotum is short, stout, and golden, that of the vertex of the head short; whereas in the single specimen of *atrata* before us the pubescence on both pronotum and vertex is long, slender, and pale in colour.

Six specimens have been studied from Texas and Kansas.

Type locality: Texas.

¹ Smith. Misc. Coll., vol. XI, p. 225 (1874).

- (43) *Anoplodera proxima* Say, 1823, Jour. Ac. Nat. Sci. Phila., vol. 3, p. 420.
subpubescens Kby., 1837, Faun. Bor. Am., pt. 4, p. 180.
terminata Dej., 1837, Dej. Cat., 3 ed., p. 383.
kempiana Csy., 1924, Mem. on the Coleop., vol. XI, p. 280.

- (44) *Anoplodera minnesotana* Csy., 1913, Mem. on the Coleop., vol. IV, p. 269.

In a long series examined in this study, few constant differences separating the *proxima-minnesotana* series have been found, other than the secondary sexual characters stated below. The punctation and colour, truncation of the elytral apices, pubescence, angulation of the pronotum, all vary; but *proxima* is strongly angulate at the sides of the pronotum, whereas *minnesotana* is rounded. The males and females may be easily distinguished by the following characters:

a. Females, with the last dorsal sclerite strongly carinate along the median line on the apical fourth. *proxima* Say.

b. Females, with the median area of the last dorsal broadly convex towards the apex, but at most only feebly carinate. *minnesotana* Csy.

c. Males, with the last ventral very deeply, triangularly cleft at the apex. *proxima* Say.

d. Males, with the last ventral flattened and subsulcate towards the apex. *minnesotana* Csy.

The females of both series, *a* and *b*, have the last ventral segment variably sulcate.

It is not possible now to decide which of these forms Mr. Say had before him when he described *proxima*. Col. Casey has described the male (*c*) with the last ventral deeply cleft as *proxima* Say and this should be accepted as fixing the species. *A. minnesotana* Csy. was described from a male (*d*) with the last ventral uncleft. The relation of the sexes has been established by the writers through the collection of pairs.

In the type series of *minnesotana* there are two males from Wisconsin, with the last ventral uncleft, followed by two males and eight females from Marquette, Michigan. The females have the carina on the last dorsal segment only faintly and broadly suggested. The single type of *kempiana* Csy. is a large female with all the characters of *proxima*, except that the pygidial carina is horn-like apically. It may prove to be distinct.

A. subpubescens Kby. cannot be placed from the description in any of these four variations and is left under *proxima* Say.

Seventy specimens had been examined before the relation of the sexes was discovered, from New York, Massachusetts, Maine, Northern Illinois, Ontario, Quebec, Manitoba, British Columbia, and Kansas. Other localities cited in literature: New Hampshire, Virginia, Georgia, Montana, Wisconsin, and Pennsylvania.

Host plants: *Acer* (Felt), *Acer*, *Hicoria*, *Castanea*, *Tilia* (Craighead).

Type locality: *proxima*, Missouri.

Type locality: *minnesotana*, Wisconsin (Bayfield).

- (45) *Anoplodera canadensis* Oliv., 1795, Ent., vol. IV, (73), p. 8.
coccinea Lec., 1874, Smith. Misc. Coll., vol. XI, p. 226.
cinnamoptera Hald., 1847, Trans. Am. Phil. Soc., (2),
 vol. 10, p. 64.
cribripennis Lec., 1859, Smith. Cont., vol. XI, p. 21.
erythroptera Kirby, 1837, Fauna Bor. Am., pt. 4, p. 180.
 var. *ebena* Leng., 1890, Ent. Am., p. 197.
 var. *divisa* Csy., 1924, Mem. on the Coleop., p. 281.
tenuicornis Hald., ♂, 1852, Trans. Am. Phil. Soc., vol. X,
 p. 64.

Length 10 to 20 mm. Under *A. cribripennis*, Doctor Le Conte comments that a specimen from Oregon has the elytra black and that two other specimens were black with red shoulders and finally says:¹

"Finding no difference but that of colour, I not only believe these to be merely varieties, but also suppose that *A. canadensis* Fabr. and *A. erythroptera* Kirby (nec. Germ.) are corresponding varieties of another species, the entirely black variety of our eastern species is as yet unknown."

Doctor Hamilton² considered the European *A. variicornis* Dalm. to be the same as *erythroptera* or *cinnamoptera*. In his "Distribution of the Coleoptera," he says of *A. canadensis*, "very variable."

"*Variicornis* Dalm. should be compared with *erythroptera* or *cinnamoptera*, as a comparison with typical *canadensis* would be misleading." "Across the northern part of the continent from the Atlantic to the Pacific through the Rocky mountains, to New Mexico and also in the Alleghanies. Europe (northern Germany, Russia), western and common in eastern Siberia to the north of the Amur."

"An entirely black example was taken in Japan by Mr. George Lewis."

Later, Leconte³ himself evidently considered his own *cribripennis* as *canadensis*, for he enumerates it in his synonymy in his key to *Leptura*.

In the material that we have examined there are two types of punctuation and lustre that deserve consideration. In the western form known as *cribripennis*, which extends eastward to Manitoba, the punctuation of the elytra is constantly very coarsely cribrate throughout and the interspaces between the punctures are polished, giving the elytra a bright, shining lustre. In the females of the eastern form, the elytral punctuation is consistently smaller, particularly on the caudal half, and the interspaces between the punctures are finely reticulate, giving the elytra a decidedly opaque lustre. The males of the eastern form are in many cases intermediate in both punctuation and lustre between these two conditions. In colour, the western material shows a greater variation; many individuals have the elytra entirely black (females in all we have seen), or black with minute red basal spots; some have the elytra entirely red, or red with the apices black; and the majority have the elytra black with a red basal band of variable width, in many cases covering the basal third and occasionally the basal half. The caudal margin of the red band is usually strongly arcuate. In the eastern form the elytra are usually black with a narrow, basal red band rarely covering more than the basal fifth, and specimens with the elytra entirely red, or red with the extreme tips black, are not uncommon. The entirely black variation has not been seen by us from the eastern part of the continent.

¹ Proc. Acad. Nat. Sci., 1861, p. 355.

² Trans. Am. Ent. Soc., vol. XXI, p. 396 (Dec., 1894).

³ Smith. Misc. Coll., vol. XI (1873).

Of the one hundred and seventy specimens examined there were 121 with the elytra black and a red basal band, 18 with the elytra red or red with the apices black, 21 with the elytra entirely black, and 10 with the elytra black, excepting minute basal red spots. The localities represented in this collection extend from the Mexican line northward to Alaska, eastward to the Atlantic, and from Michigan south to Pennsylvania.

We are unwilling to make any specific distinction in this material and it is all left for the present under the name *canadensis* Oliv.

Host plants: *Pinus*, *Tsuga* (Craighead), *Picea* (Felt), *Pinus strobus* (J.M.S.), *Pinus ponderosa* (Hopping).

(46) *Anoplodera planata* n. sp.

Length 14 mm., male. General habitus of *L. canadensis* Oliv. Colour black, tibiae, tarsi, and elytra reddish brown, the latter without markings in the type.

The head is inflated and abruptly constricted behind the eyes, the antennae distinctly, though not very strongly, serrate, uniformly black. The pronotum is slightly longer than wide, gradually, distinctly narrowed toward the front, the sides arcuate, broadly, strongly constricted in front and behind; the anterior and caudal impressions very deep and continuous across the dorsum, giving the disk a decidedly inflated appearance, but with the disk only feebly convex, subplanate, with the area about the median line broadly feebly impressed, more strongly in front; the disk densely punctured, the punctures of moderate size, here and there indistinctly confluent; the punctures smaller and denser about the median line in front; the anterior impression shining with the punctures indistinct; the pubescence distinct, recumbent, and pale brown in colour, the caudal angles of the disk somewhat protuberant, as in certain *Acmaeops*.

The elytra are elongate, feebly dehiscent at the apex, the apices obliquely emarginate with the lateral angles acute, the side margins only feebly sinuate; the punctation small and rather close, finer and closer toward the apex; the pubescence recumbent, distinct, pale brown and obliquely arranged. The last ventral segment is flattened, widely, deeply emarginate, with the angles acute.

Holotype, ♂, Iowa. In the collection of Mr. Chas. Liebeck.

(47) *Anoplodera chrysocoma* Kirby, 1837, Faun. Bor. Am., vol. IV, London, p. 179.

auripilis Lec., 1850, Jour. Acad. N.S. Phila., (2), p. 339.

var. *densepilosa* Csy., 1924, Mem. on the Coleop., p. 281.

aureola Csy., 1913, Mem. on the Coleop., p. 268.

Length 10 to 18 mm. This is one of our most widely distributed species. Specimens from high altitudes in many cases have a darker coloration diffused toward the sides and apices of the elytra.

Two hundred and twenty-three specimens have been examined from New Mexico, Colorado, Utah, California, Oregon, Washington, Montana, British Columbia, Manitoba, Ontario, Quebec, Nova Scotia, Newfoundland, and Massachusetts. Other localities cited in literature: Hudson bay, Michigan, lake Superior, Maine, and New York.

Host plants: *Pinus flexilis*, *Pinus ponderosa* (Craighead), *Pinus ponderosa* (Hopping).

Type locality: Nova Scotia.

- (48) *Anoplodera nigrolineata* Bland, 1865, Proc. Ent. Soc. Phila., vol. 4, p. 383.

Length 12 to 14 mm. This is a narrower, more elongate species and easily distinguished from *chrysocoma* by the shorter, oblique pubescence and the very much coarser and sparser elytral punctation.

Eighteen specimens examined, from New Mexico and Colorado. Idaho is also cited in literature.

Type locality: Colorado.

- (49) *Anoplodera rubrica* Say, 1823, Jour. Acad. Nat. Sci. Phila., vol. 3, p. 418.

annulata Dej., 1837, Dej., Cat., 3 ed., p. 382.

erythroptera Germ., 1824, Spec. Ins. nov., p. 522.

Length 10 to 13 mm. The elytra are almost uniformly red and opaque. We have one specimen from Ohio with the elytra black and another from Illinois with the elytra red but shining, both probably this species. The antennæ are annulated in both sexes and the elytra are cuneiform, strongly dehiscent at the apex with the lateral margins strongly sinuate.

Thirty-nine specimens have been examined from Virginia, Pennsylvania, New York, New Jersey, Massachusetts, and Ontario. Other localities mentioned in literature: Georgia, Northern Illinois, Michigan, Nebraska, Colorado, and Kansas.

Host plants: Hardwoods and conifers (Craighead).

Type series: "On the Missouri and Pennsylvania."

- (50) *Anoplodera dehiscens* Lec., 1859, Proc. Acad. N.S. Phila., p. 89.

Length 9 to 13 mm. This species seems to be rare in collections. The elytra is ferruginous in both sexes. Superficially it resembles the females of *A. sanguinea* Lec., but it is more robust and the elytral apices are more strongly dehiscent. The only male we have seen was from Corvallis, Oregon, in the collection of the Oregon Agricultural college.

Eleven specimens have been examined, all from British Columbia and Oregon. Washington is also cited in literature.

Type locality: Oregon.

- (51) *Anoplodera vagans* Oliv., 1795, Entomologie Paris, vol. 4, p. 31.

axillaris Dej., 1837, Dej. Cat., 3rd, p. 382.

brevis Kirby, 1837, Fauna Bor. Am., vol. 4, p. 182.

cuneatula Csy., 1913, Mem. on the Coleop., p. 253.

fusella Csy., 1913, Mem. on the Coleop., p. 254 (♂).

puella Csy., 1913, Mem. on the Coleop., p. 254.

champlaini Csy., 1913, Mem. on the Coleop., p. 254.

var. *tetrica* Csy., 1913, Mem. on the Coleop., p. 255.

Length 7 to 9 mm. This species varies greatly in colour. The elytra may be entirely black, entirely testaceous, or bicoloured with a black basal lateral band, a wide black sutural band connected with the lateral band in front of the humeri, and a testaceous or reddish band from the humerus to the apex. A few black specimens have only a basal testaceous or reddish spot, and those with testaceous elytra may have a nebulous black area near the apices.

We are unable to separate these colour forms by any definite characters. The elytra are unusually stout, cuneiform, and the apices are very strongly dehiscent.

A. cuneatula Csy. agrees in all respects with individuals in our series of *vagans* Lec. *A. fusella* Csy. in the Casey collection is a single male with fuscous elytra, and the head and pronotum more sparsely punctured than usual, but not more so than in some of our series. The type of *A. puella* Csy. has red humeri. The second specimen is very coarsely punctured and shining, added after the original description was written. The second specimen mentioned in the text is in the Casey collection as *tetrica* Csy., a male, entirely piceous with the pronotum slightly wider than usual. *A. champlaini* Csy., type, is a large female of *vagans* with red elytra; the second specimen is similar but darker in colour. These forms seem to us all individual variations; there are many such variations in our long series, including size and density of punctation, precise shape of pronotum and elytra, and width between the eyes.

Forty-three specimens have been examined from Nova Scotia, New Brunswick, Ontario, Wisconsin, Pennsylvania, and Alabama. Other localities cited in literature: New Hampshire, Massachusetts, New Jersey, New York, Virginia, North Carolina, Georgia, Michigan, Maine.

Host plant: *Pinus* (Craighead).

- (52) *Anoploclera circumdata* Oliv., 1795, Entomologie, Paris, vol. 4, p. 32.
subquadrata Csy., 1913, Mem. on the Coleop., vol. IV, p. 251.

Length 7 to 8 mm. The antennæ of this species are annulated, the elytra testaceous, with humeri and apices black, the apices feebly dehiscent and transversely truncate.

A. subquadrata Csy. is represented in the Casey collection by a single female, at least very closely allied to *circumdata* Oliv. It is stouter than usual with the head exceptionally wide between the eyes and the hind angles of the pronotum distinctly flaring. It may prove to be a distinct species.

Nineteen specimens have been examined from New Jersey, Massachusetts, and Pennsylvania.

- (53) *Anoploclera pernigra* Linell., 1896, Proc. U.S. Nat. Mus., vol. 19, p. 397.

Length 9.5 to 11 mm. The colour is entirely black. The hind tibial spurs are unusually short. It is in many cases found on umbelliferous flowers at an elevation of about 6,000 feet in Sierra Nevada mountains, California.

Twenty-five specimens have been studied from Kern and Tulare counties, California, in addition to the type series in the collection of the U.S. National Museum.

Type locality: Wilsons Peak, Los Angeles county, California.

- (54) *Anoploclera vexatrix* Mann., 1853, Bull. Soc. Nat. Moscow, vol. 26, p. 250.

convolvens Csy., 1913, Mem. on the Coleop., p. 250 (♂).

quadrillum Lec., 1859, Proc. Acad. Nat. Sci. Phila., p. 88.

Length 9 to 10 mm. Dr. Van Dyke spoke of the variation in this species before the Philadelphia Entomological Society in 1906, citing *quadrillum* as only a blacker form of *vexatrix*.

Sixty-four specimens have been examined from California, Oregon, Washington, British Columbia, and Alaska, seventeen of which were typical *vexatrix* and thirty-three grading from *vexatrix* through *quadrillum* to an entirely black form.

Type locality: Alaska.

- (55) *Anoplodera pubera* Say, 1827, Jour. Acad. Nat. Sci. Phila., (2), vol. 2, p. 279.

Length 8 to 12 mm. An entirely black, shining species with the apex of the elytra more strongly declivous than usual.

Ninety-three specimens were examined from Kansas, Ohio, New York, Maine, Quebec, Ontario, and Manitoba. Other localities cited in literature: New Hampshire, Pennsylvania, Virginia, Northern Illinois, Michigan, Massachusetts, Georgia.

Type locality not given.

- (56) *Anoplodera vittata* Swed., 1787, Act. Stockh., 8, 3, No. 3, 20.
vittata Oliv., 1792, Encyc. Method., vol. 7, p. 523.
abbreviata Germ., 1824, Ins. Spec. Nov., p. 523.
limbata Knoch., 1801, New Species of Insects.
semivittata Kirby, 1837, Fauna Bor. Am., pt. 4, p. 183.
nitidipennis Provancher, Petite Faune, vol. 1, p. 622.

Length 10 to 12 mm. The elytra are elongate, but little narrowed behind, usually bicoloured, with sides, suture, and apex black and a testaceous or reddish longitudinal, median vitta on the basal two-thirds. The testaceous vitta is occasionally reduced to a feeble basal marking, and we have seen two specimens with the elytra almost entirely testaceous.

One hundred and sixty-four specimens have been examined from North Carolina, Pennsylvania, New York, Massachusetts, Maine, Nova Scotia, New Brunswick, Ontario, and Quebec. Other localities given in literature: New Hampshire, New Jersey, Virginia, Georgia, Alabama, Northern Illinois, Michigan, Louisiana, and Wisconsin.

Host plants: "Hickory?" (Bland), *Abies*, *Pinus*, *Juniperus*, *Castanea* (Craighead).

Leptura nitidipennis Prov. The type could not be found in the Provancher collection, Quebec city, and the species is included here with *vittata* Swed.

"(22) Lepture à élytres brillantes. *Leptura nitidipennis*, nov. sp.

Long. 40 ponce. Entièrement noire. Tête noire, prolongée en arrière des yeux. Antennes assez longues, distantes à la base, insérées tout près des yeux. Prothorax convexe, avec une impression profonde à la base, rétréci et resserré en avant, à ponctuation peu denses, pubescent. Elytres subparallèles, polies, brillantes, à ponctuations peu denses, arrondies et distinctement rebordées à l'extrémité. Dessous à pubescence grise, courte, soyeuse.

Assez commune. Très rapprochée par la forme de la *vittata*, à l'exception toutefois de la tête qui n'est pas prolongée en arrière des yeux et dont les antennes à la base sont aussi beaucoup plus distantes que dans celle-ci."

(*Leptura*) *rufula* Hald. The type in the LeConte collection belongs to the genus *Acmaeops* Lec.

(*Leptura*) *ignita* Schaeffer. We have examined the type and, through the kindness of Mr. Schaeffer, we have one specimen before us. This species evidently belongs close to the genus *Euryptera*.

The remaining genera of the tribe will form the subject of the second part of this paper.

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PLATE I

Pidonia Muls.

- Figure 1. *gnathoides* Lec., ♀, x 6.
 Figure 2. *ruficollis* Say, ♂, x 5.
 Figure 3. *ruficollis* Say (*vibex*), ♂, x 5.
 Figure 4. *straussi* Webb, ♀, x 5.
 Figure 5. *scripta* Lec., ♀, x 5½.
 Figure 6. *scripta* Lec., ♀, x 5.
 Figure 7. *aurata* Horn, ♀, x 5.

Idiopidonia n. gen.

- Figure 8. *pedalis* Lec., ♀, x 5.

Pseudostrangalia n. gen.

- Figure 9. *cruentata* Hald., ♀, x 5½.

Grammoptera Serv.

- Figure 10. *campanifera* Csy., ♀, x 6.
 Figure 11. *molybdica* Lec., ♂, x 6.
 Figure 12. *molybdica* Lec., ♀ (*militaris*), x 7.
 Figure 13. *exigua* Newm., ♀, x 5.
 Figure 14. *haematites* Newm., ♀, x 5.
 Figure 15. *subargentata* Kby., ♂, x 5½.
 Figure 16. *ruficeps* Lec., ♂, x 6.
 Figure 17. *filicornis* Csy., ♀, x 6.

Alosterna Muls.

- Figure 18. *rubida* Lec., ♀, x 6.
 Figure 19. *capitata* Newm., ♀, x 5.
 Figure 20. *chalybea* Hald., ♂, x 6.

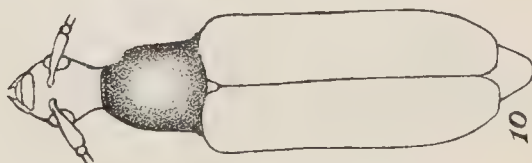
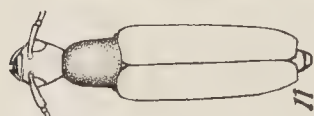
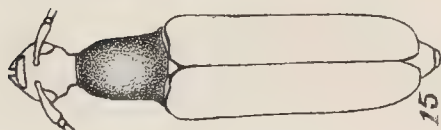
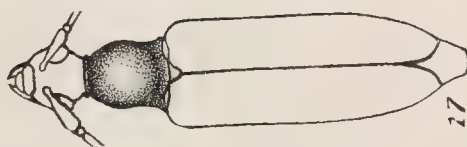
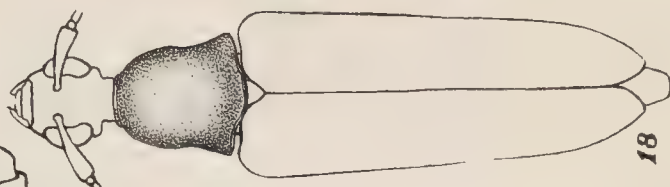
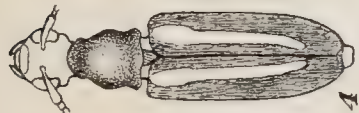
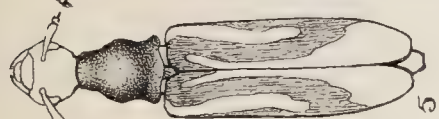
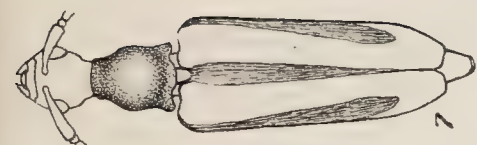
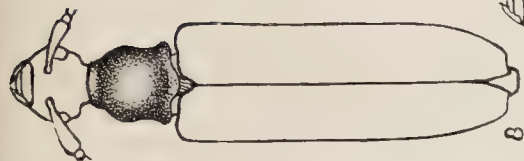
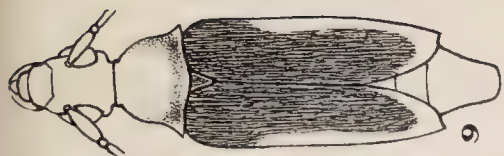
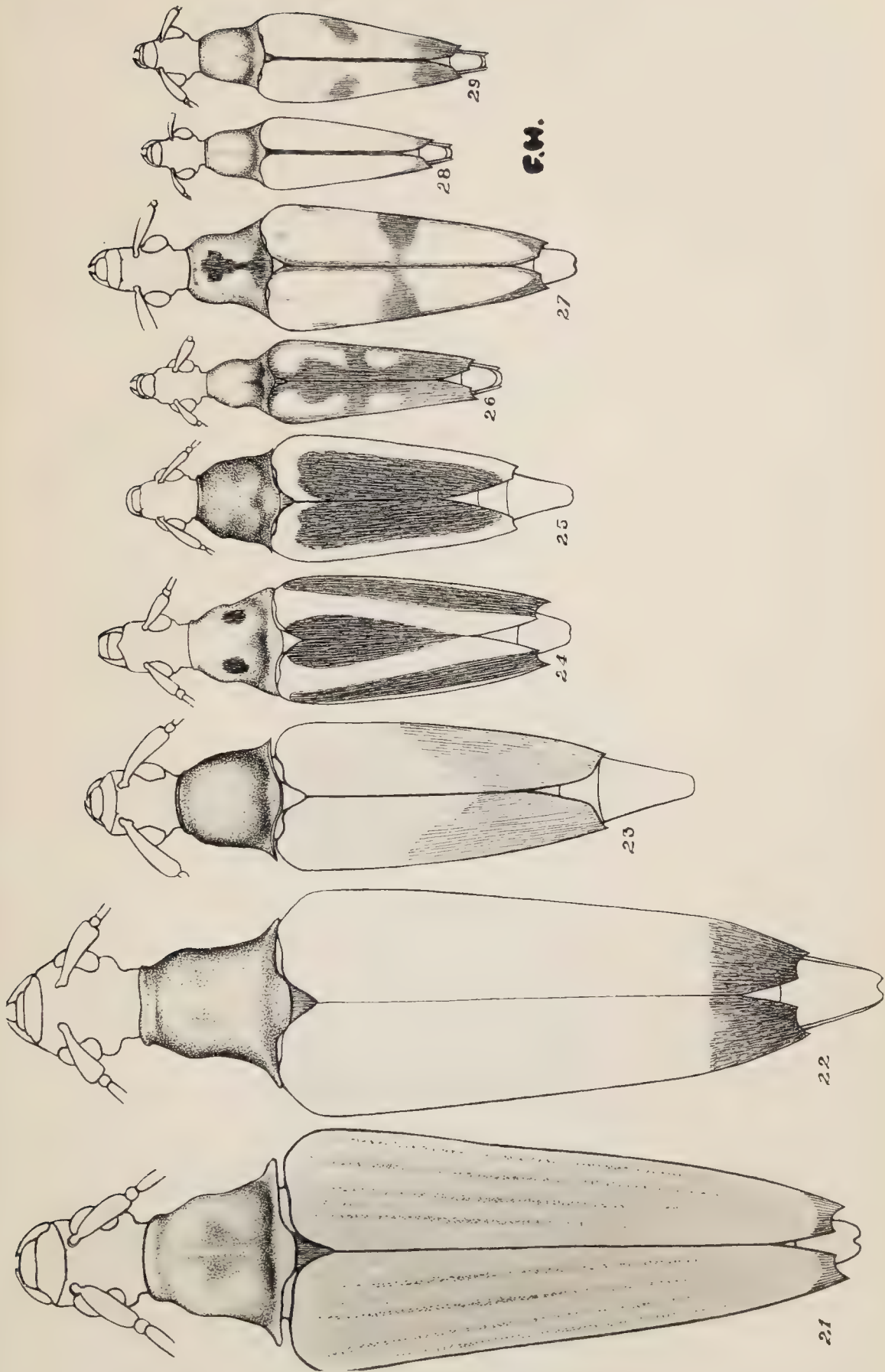


PLATE II

Leptura L.

- Figure 21. *gigas* Lec., ♀, x $4\frac{1}{2}$.
Figure 22. *emarginata* Fab., ♀, x $4\frac{1}{2}$.
Figure 23. *anthracina* Lec., ♀, x $4\frac{1}{2}$.
Figure 24. *abdominalis* Hald., ♀, x $4\frac{1}{2}$.
Figure 25. *plagifera* Lec., ♀, x 5.
Figure 26. *subhamata* Rand., ♂, x $4\frac{1}{2}$.
Figure 27. *subhamata* Rand., ♀, x $4\frac{1}{2}$.
Figure 28. *plebeja* Rand., ♂, x $4\frac{1}{2}$.
Figure 29. *propinqua* Bland., ♂, x $4\frac{1}{2}$.



C.H.

PLATE III

Leptura L.

Figure 30. *obliterata* Lec. (*soror*), ♀, x $4\frac{1}{2}$.

Figure 31. *obliterata* Lec., ♀, x $4\frac{1}{2}$.

Figure 32. *deleta* Lec., ♀, x 4.

Figure 33. *lineola* Say, ♂, x $4\frac{1}{2}$.

Typocerus Lec.

Figure 34. *acuticauda* Csy., ♂, x 5.

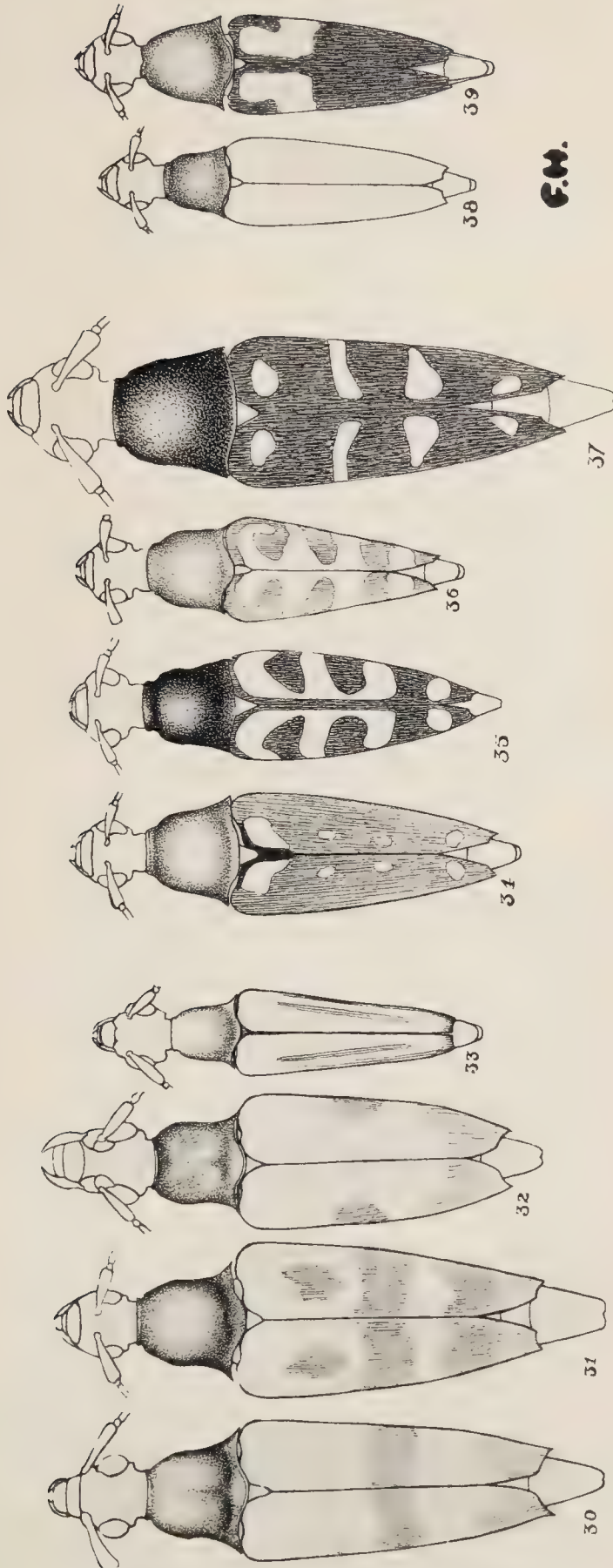
Figure 35. *zebratus* Oliv., ♀, x 5.

Figure 36. *zebratus* Oliv., ♂, x 5.

Figure 37. *badius* Newm., ♀, x $5\frac{1}{2}$.

Figure 38. *lugubris* Say, ♂, x $4\frac{1}{2}$.

Figure 39. *lunatus* Fab., ♂, x $4\frac{1}{2}$.



F.W.

PLATE IV

Typocerus Lec.

- Figure 40. *sparsus* Lec., ♀, x $5\frac{1}{2}$.
Figure 41. *balleatus* Horn, ♀, x 5.
Figure 42. *brunnicornis* Lec., ♂, x 5.
Figure 43. *velutinus* Oliv., ♀, x 5.
Figure 44. *manitobensis* n. sp., ♀, x $5\frac{1}{2}$.
Figure 45. *confluens* Csy., ♂, x $5\frac{1}{2}$.
Figure 46. *sinuatus* Newm., ♀, x 5.
Figure 47. *sinuatus* Newm., ♂, x 5.
Figure 48. *gloriosa* Hop., ♀, x $5\frac{1}{2}$.

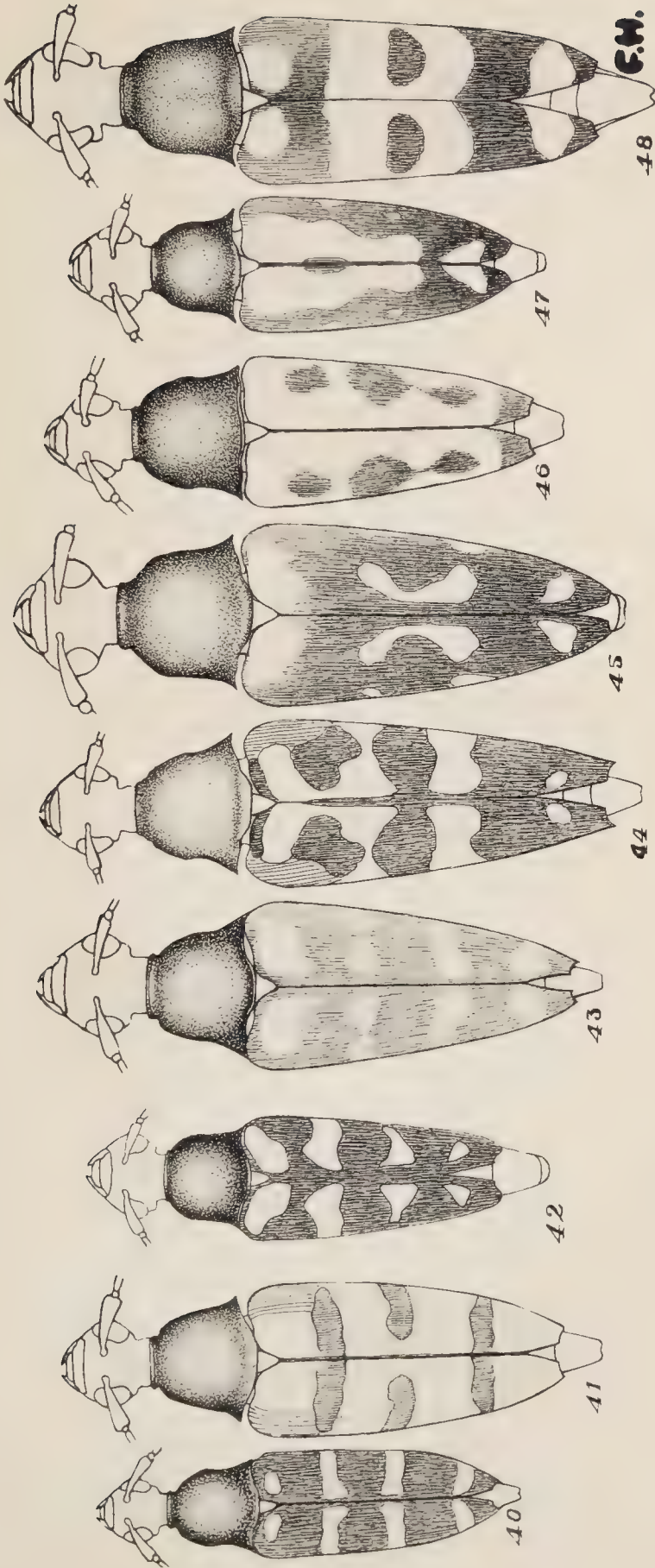


PLATE V

Anoplodera Mulsant

- Figure 49. *carbonata* Lec., ♂, x 5.
Figure 50. *carbonata* Lec., ♀, x 5.
Figure 51. *brevicornis* Lec., ♂, x 5½.
Figure 52. *nigrella* Lec., ♀, x 5.
Figure 53. *matthewsii* Lec., ♀, x 5.
Figure 54. *grossa* Lec., ♂, x 5½.
Figure 55. *instabilis* Hald., ♂, x 5.
Figure 56. *instabilis* Hald., ♀, x 5.

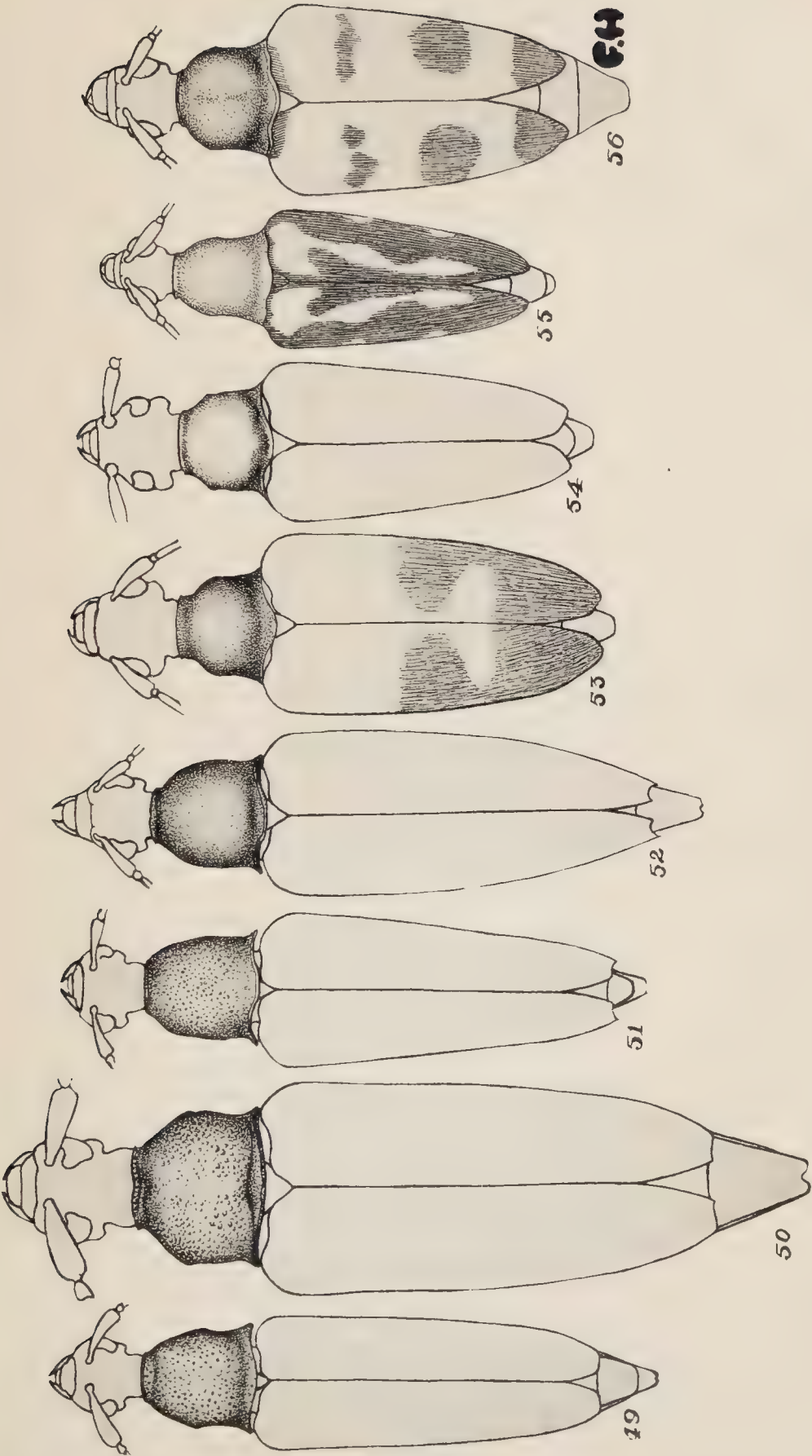


PLATE VI

Anoplodera Mulsant

- Figure 57. *sexmaculata* Linn., ♀, x 6.
Figure 58. *tribalteata* Lec., ♀, x 5.
Figure 59. *coquilletti* Linell., ♂, x 5.
Figure 60. *amabilis* Lec., ♀, x 5.
Figure 61. *barbari* Fall, ♀, x 5.
Figure 62. *cordifera* Oliv., ♀, x $5\frac{1}{2}$.
Figure 63. *knulli* n. sp., ♀, x 5.
Figure 64. *sexspilota* Lec., ♀, x $5\frac{1}{2}$.
Figure 65. *isabellae* Hop., ♂, x 5.
Figure 66. *swainei* Hop., ♂, x $5\frac{1}{2}$.
Figure 67. *impura* Lec., ♂, x $4\frac{1}{2}$.



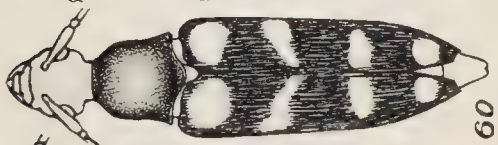
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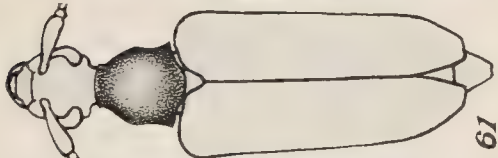
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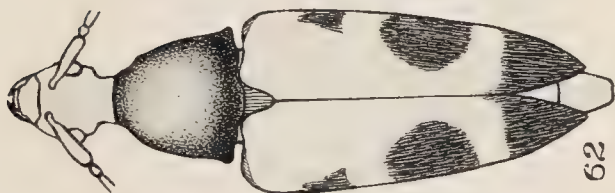
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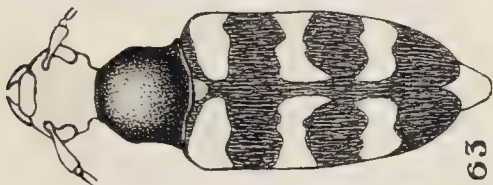
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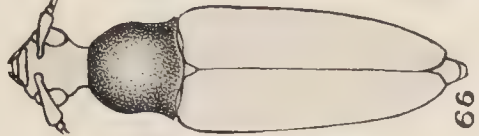
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C.H.

PLATE VII

Anoploclera Mulsant

- Figure 68. *nitens* Forst., ♀, x 6.
Figure 69. *tigrina* Csy., ♂, x 6.
Figure 70. *laeta* Lec., ♀, x 5.
Figure 71. *crassicornis* Lec., ♀, x 5.
Figure 72. *crassicornis* Lec., ♂, x $5\frac{1}{2}$.
Figure 73. *tibialis* Lec., ♀, x $5\frac{1}{2}$.
Figure 74. *crassipes* Lec., ♀, x $5\frac{1}{2}$.
Figure 75. *crassipes* Lec., ♂, x $5\frac{1}{2}$.
Figure 76. *behrensi* Lec., ♀, x $5\frac{1}{2}$.
Figure 77. *octonotata* Say, ♀, x $5\frac{1}{2}$.

Plate VII



PLATE VIII

Anoplodera Mulsant

Figure 78. *cockerelli* Fall, ♀, x 5.

Figure 79. *valida* Lec., ♀, x 5.

Figure 80. *insignis* Fall, ♀, x 5.

Figure 81. *obscura* n. sp., ♀, x 8.

Figure 82. *aspera* Lec., ♀, x 5.

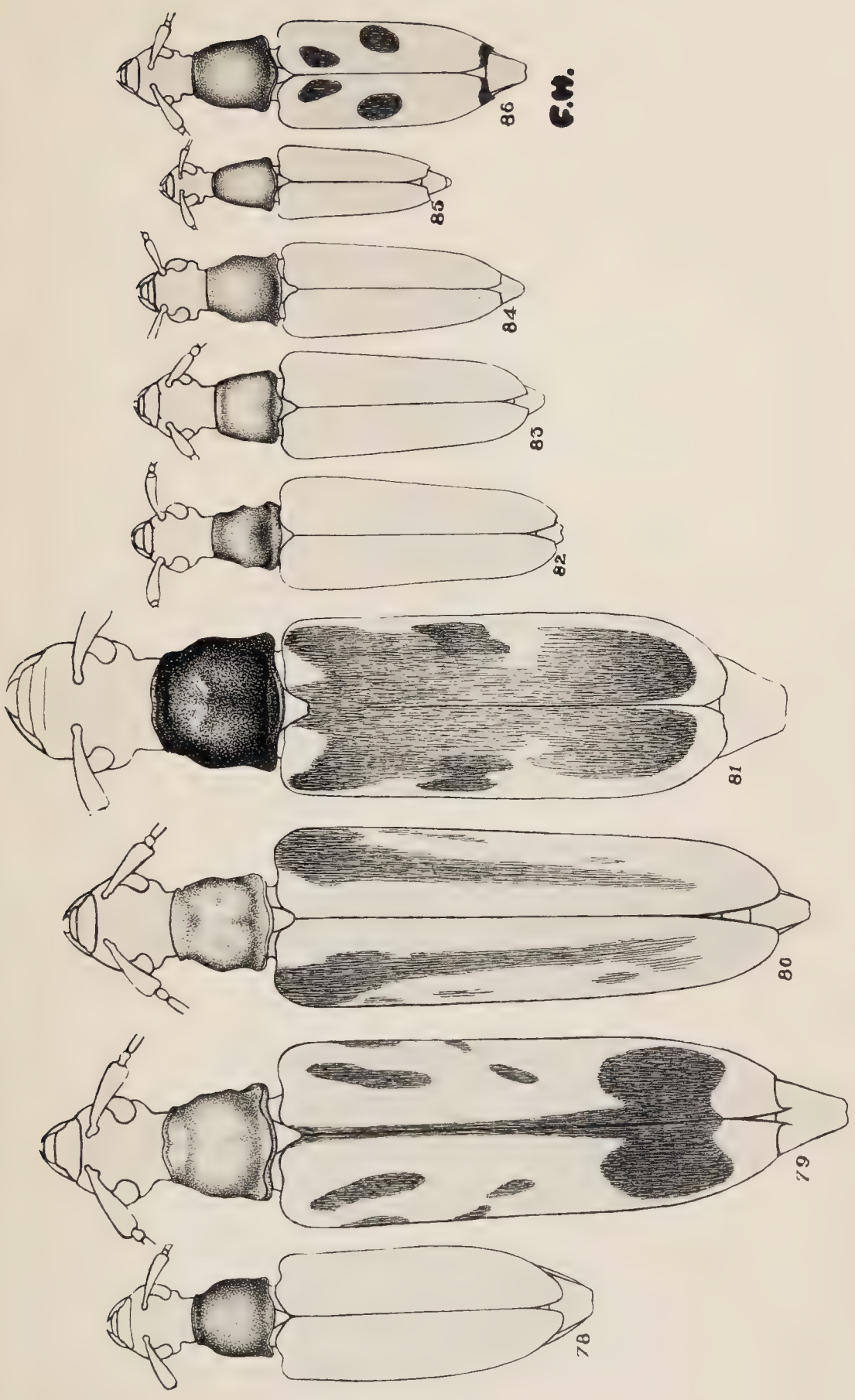
Figure 83. *mutabilis* Newm., ♀, x 5.

Figure 84. *sanguinea* Lec., ♀, x 6.

Figure 85. *laetifica* Lec., ♂, x 5.

Figure 86. *laetifica* Lec., ♀, x 6.

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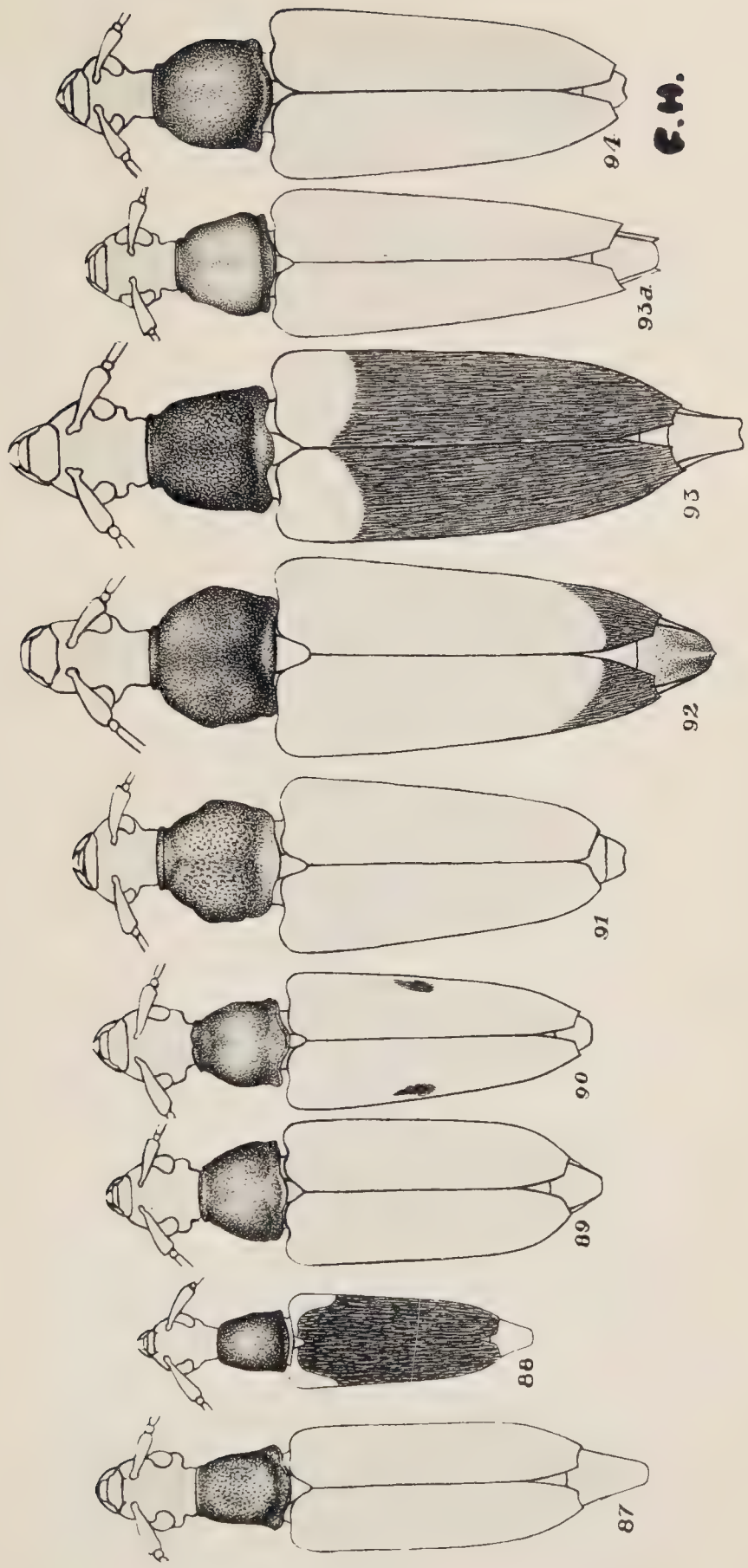


C.W.

PLATE IX

Anoplodera Mulsant

- Figure 87. *lucifera* Hop., ♀, x 5.
Figure 88. *haldemanni* Csy., ♀, x 5.
Figure 89. *dolorosa* Lec., ♀, x 5.
Figure 90. *biforis* Newm., ♀, x $5\frac{1}{2}$.
Figure 91. *atrata* Lec., ♀, x 6.
Figure 92. *proxima* Say, ♀, x 5.
Figure 93. *canadensis* Oliv., ♀, x 5.
Figure 93a. *planata* n. sp., ♀, x 6.
Figure 94. *chrysocoma* Kby., ♀, x $5\frac{1}{2}$.

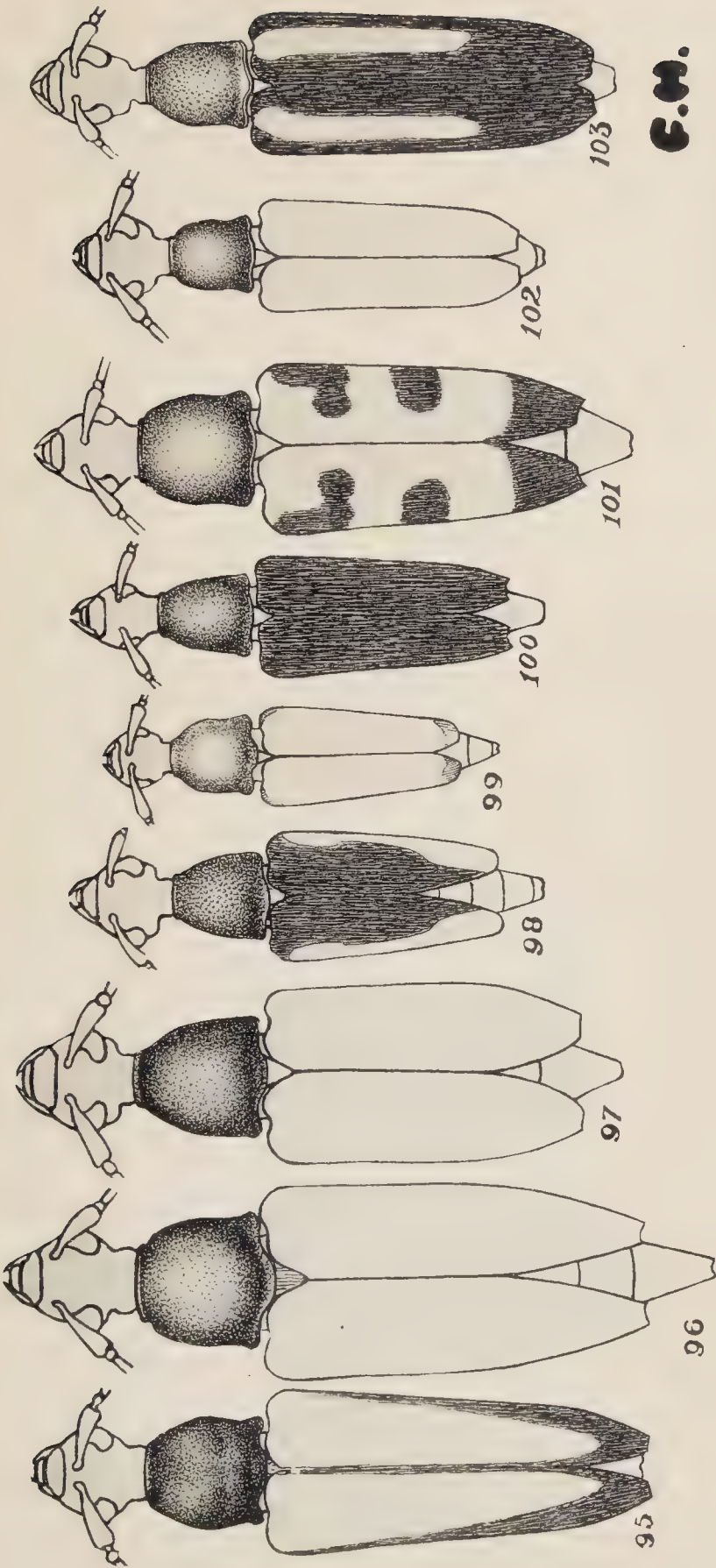


C.H.

PLATE X

Anoplodera Mulsant

- Figure 95. *nigrolineata* Bland, ♀, x $5\frac{1}{2}$.
Figure 96. *rubrica* Say, ♀, x $5\frac{1}{2}$.
Figure 97. *dehiscens* Lec., ♀, x $5\frac{1}{2}$.
Figure 98. *vagans* Oliv., ♂, x $5\frac{1}{2}$.
Figure 99. *circumdata* Oliv., ♂, x 6.
Figure 100. *pernigra* Linell., ♀, x 5.
Figure 101. *vexatrix* Mann., ♀, x 6.
Figure 102. *pubera* Say, ♂, x 5.
Figure 103. *vittata* Oliv., ♀, x $5\frac{1}{2}$.



C.H.

PLATE XI

Venation of the basal portion of the right wing of *Centrodera spurca* Lec.: 1, first axillary; 2, second axillary; 3, third axillary; 1st A., 2nd A., 3rd A., 4th A., first, second, third, and fourth anal veins; arc., arculus; C., costa; c.a., cubito-anal cross-vein; Cu., cubitus; Sc., subcosta; R., radius.

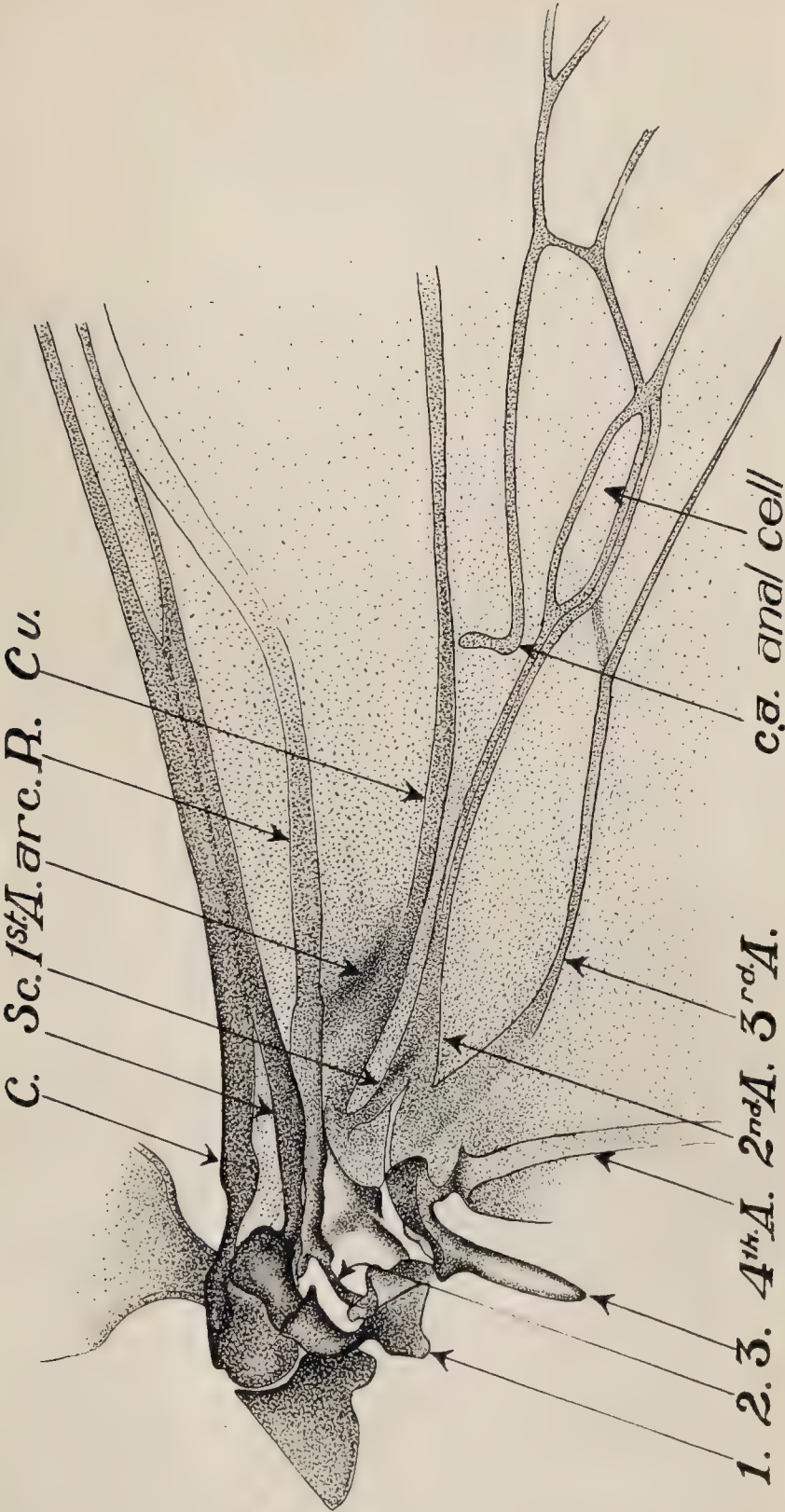


PLATE XII

Wing Venation in the Lepturini

- Figure 1. *Leptura subhamata* Rand.
 Figure 2. " *propinqua* Bland.
 Figure 3. " *obliterata* Hald.
 Figure 4. " *lineola* Say.
 Figure 5. *Typocerus lunata* Fab.
 Figure 6. " *sparsus* Lec.
 Figure 7. *Strangalina luteicornis* Fab.
 Figure 8. *Bellamira scalaris* Say.
 Figure 9. *Charisalia americana* Hald.
 Figure 10. *Euryptera huachucae* Schffr.
 Figure 11. *Anoplodera proxima* Say.
 Figure 12. " *octonotata* Say.
 Figure 13. " *mutabilis* Newm.
 Figure 14. " *instabilis* Hald.
 Figure 15. " *canadensis* Oliv.
 Figure 16. " *vittata* Oliv.
 Figure 17. " *insignis* Fall.
 Figure 18. " *laetifica* Lec.

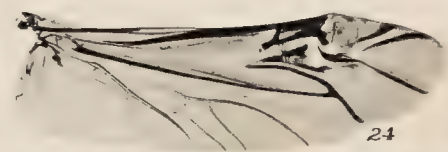
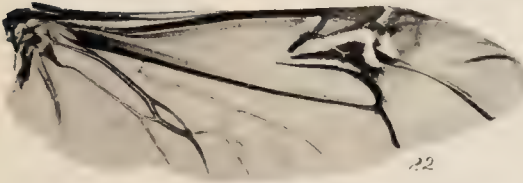
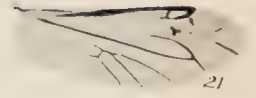
Plate XII



PLATE XIII

Wing Venation in the Lepturini

- Figure 19. *Centrodera decolorata* Harris.
- Figure 20. *Pachyta liturata* Kby.
- Figure 21. *Eucyclops coerulea* Say.
- Figure 22. *Anthophilax mirificus* Bland.
- Figure 23. *Stenocorus lineatus* Oliv.
- Figure 24. *Toxotus vestitus* Hald.
- Figure 25. *Pyrotrichus viticollis* Lec.
- Figure 26. *Leptacmaeops longicornis* Kby.
- Figure 27. *Leptalia macilenta* Mann.
- Figure 28. *Neopachyta rugipennis* Newm.
- Figure 29. *Acmaeops proteus* Kby.
- Figure 30. *Gaurotes cressoni* Bland.
- Figure 31. *Pidonia scripta* Lec.
- Figure 32. *Evodinus monticola* Rand.
- Figure 33. *Idiopidonia pedalis* Lec.
- Figure 34. *Grammoptera subargentata* Kby.
- Figure 35. *Alosterna rubida* Lec.
- Figure 36. *Alosterna capitata* Newm.
- Figure 37. *Cyphonotida ventralis* Horn.
- Figure 38. *Pseudostrangalia cruentata* Hald.



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